THE RESOURCES OF THE EMPIRE

A business man's survey of the Empire's resources prepared by the Federation of British Industries.

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THE RESOURCES OF THE EMPIRE SERIES

CROPS & FRUITS

BY

J. R. AINSWORTH-DAVIS, M.A., M.Sc.
(Late Principal of the Royal Agricultural College)

WITH A FOREWORD
BY
H.R.H. THE PRINCE OF WALES, K.G.

AND GENERAL INTRODUCTIONS BY
THE RT. HON. SIR ERIC GEDDES, G.C.B.
(President of the Federation of British Industries)
AND
STANLEY MACHIN, J.P.
(Vice-President, Associated British Chambers of Commerce)

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FOREWORD

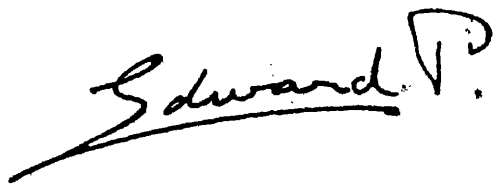
BY

H.R.H. THE PRINCE OF WALES, K.G.

No business man—especially should he contemplate an extension of activities—can afford to dispense with periodical stock-taking. The necessity for this applies equally to a country or empire, particularly when recovering from a devastating war that has resulted in heavy liabilities and dislocated the accustomed routine of trade and commerce. We are all proud of the British Empire, embracing more than a quarter of the world's land area and a similar proportion of its inhabitants, but very many of us fail to realize the infinite variety and vast extent of the Empire's natural products, which are capable of being made self-sufficing.

The volumes of this Series pass in review the material resources of the Empire, and constitute, as it were, an Imperial stock-taking. They deal with food and raw materials of every kind, summarize the present condition of inter-Imperial trade, and indicate where further developments are possible.

At the present moment, when our great British Empire Exhibition is imminent, they should be of special interest both at home and overseas. It gives me great pleasure to recommend them to all those who have at heart the proper organization of the Empire's natural wealth.



GENERAL INTRODUCTION

BY

THE RIGHT HON. SIR ERIC GEDDES, G.C.B.

IN undertaking the preparation of this Series the Federation of British Industries has, I am convinced, rendered a really practical service to business men throughout the Empire.

Hitherto, there has been no standard work of reference giving the information which ought to be in the possession of business men all over the world regarding the resources of Great Britain and the other countries of the Empire in the materials of industry.

It is true that there are some excellent monographs describing in general terms the resources of isolated parts of the Empire, and a very few dealing comprehensively with individual products, but, apart altogether from the fact that the sum total of the information contained in existing publications falls hopelessly far short of what is requisite, such information as exists is hardly prepared in a form adapted to the requirements of the practical man who wants neither a bare table of statistics about the products essential to him in his business nor a mere general description of the extent of the resources of a given country in those products. On the contrary, the business man wants information not only as to the available supplies of his raw materials, but as to the quality of the supplies produced in different parts of the world, as to the amount of the undeveloped resources, as to the transport facilities, as to the local conditions of labour, etc., and as to the chances of present supplies available for import in this country being absorbed in the near future by local demands. In other words, he wants particulars of all those factors which have to be taken into account in the ordinary course of business, and he wants those particulars arranged in an accessible form.

The aim of this Series has been to give this information in this form, and thus to provide not only for our own use, but for the use of traders all over the world, a compendious Buyers' Guide to our Imperial resources. I venture to think that the present is a very appropriate time for this undertaking. It is not only that all our thoughts are being turned towards the idea of Empire trade and Empire development by the great Exhibition which is shortly to be opened, and which will be the most impressive demonstration of our Imperial productiveness that the world has yet seen. The whole trend of economic circumstances is forcing us in the same direction.

The world war has disastrously affected the Continent of Europe as a market for the manufactured goods of Great Britain and the products of the British Dominions. Even foreign countries which were neutral in the great struggle have suffered in the same way, though in a less degree. Our trade

with the Far East and South America has suffered serious diminution, and though more than five years have now elapsed since the cessation of hostilities the resumption of normal conditions seems but little nearer. Moreover, foreign tariffs are rising higher and higher against us all over the world. Meanwhile our own productive capacity has been substantially increased and our population has grown to such an extent that we have now two million more mouths to feed and a million more men to employ than we had in 1914. It seems clear, therefore, that we need some reorientation of our commercial policy, and the obvious direction for this seems to be the cultivation of our own inheritance. A study of the facts shows that there is good hope in such a policy. Britons in all parts of the world are bound together by ties of sentiment and custom which neither distance nor difference of conditions can seriously weaken. Not only has the tremendous investment of British money in our Overseas Dominions bound us with a golden chain: there are a thousand invisible impulses always strengthening the bond. Even in 1913 our trade with the Empire was about 25 per cent. (imports) and 36 per cent. (exports) of our total world trade. The following tables show this in more detail with a comparison with the figures for the latest twelve months available. From these it will be seen that our imports from Imperial sources show a substantial advance over pre-war, the export figures remaining about the same.

PERCENTAGES OF IMPORTS FROM VARIOUS SOURCES.

Consigned from—	*October*, 1922 *to September*, 1923.	*Year* 1913.
British India	6·0	6·3
Self-governing Dominions	16·3	13·3
Other British countries (except Hong Kong)	5·3	5·3
Europe	33·2	40·4
United States	19·6	18·4
South and Central America	10·8	10·0
Other countries	8·8	6·3

PERCENTAGES OF EXPORTS (U.K. GOODS) TO VARIOUS DESTINATIONS.

Consigned to—	*October*, 1922, *to September*, 1923.	*Year* 1913.
British India	12·2	13·4
Self-governing Dominions	18·0	17·5
Other British countries (except Hong Kong)	5·7	5·4
Europe	34·2	34·4
United States	8·0	5·6
South and Central America	8·8	10·6
Other countries	13·1	13·1

The following table shows the areas and populations of the British territories on the various continents:

SUMMARY OF AREA AND POPULATION (1921-22).

	Area (Square Miles).	*Population.*
Great Britain and Ireland	121,633	47,308,000
Europe	120	234,000
Asia	2,123,418	332,772,000
Africa	3,822,667	50,119,000
America	4,009,996	11,142,000
Australasia	3,278,917	7,795,000
Total	13,356,751	449,370,000

The following table shows the approximate purchases of British goods per head of population for the first three quarters of 1923:

	£ per Head.
India, British	0·2
Federated Malay States	0·5
Australia	7·8
New Zealand	12·3
Canada	2·3
Hong Kong	7·7
Union of South Africa	2·1

The most striking features here are the huge acreage, small population, and large volume of purchase per head of Australasia, and the relatively huge populations and small volume of purchase in the Eastern territories, with Canada and South Africa occupying an intermediate position. I will recur to this contrast later.

Finally, a few figures may be given indicative of the percentage of various important world supplies either produced or available within the Empire:

	1915.	1921.
Copper (long tons)	100,000	46,000
Percentage of world production	10·2	8·5
Lead (long tons)	—	199,400
Percentage of world production	—	22·9
Tin ore (long tons)	68,300	46,800
Percentage of world production	53·9	42·2
	1913.	1923.
Wool (including alpaca, etc.) (lbs.)	5,414,067	14,077,339
Percentage of world production	74·6	77·1

It is clear, therefore, that there is an almost unlimited field for expansion of our Empire trade, whilst in many lines this possibility of a self-supporting Empire should be realizable. On the side of Great Britain the requisite productive power already exists. Overseas the position is somewhat different, and it seems clear that the requisite development of the purchasing power of the Overseas Dominions can only be produced by a gradual development of the resources of those Dominions, the surest way to which will be an increase in our own consumption of their products. There are two distinct problems, one for the tropical and one for the temperate and subtropical countries.

In the former any substantial increase in the white population is hardly to be expected, since the bulk of the work of the country must in such climates always be done by the native races. The purchasing power of these territories can therefore only be developed by the steady development of their material

resources. This, of course, means recourse to British capital, if Great Britain is to get the greatest advantage from the development and if our Imperial ideal is to be fulfilled. In our present economic condition this, of course, presents some difficulty, but if we can carry out this programme, there will follow a greater demand for British plant, machinery, shipping, rolling stock, etc., as well as a gradual increase in the consuming power of the natives.

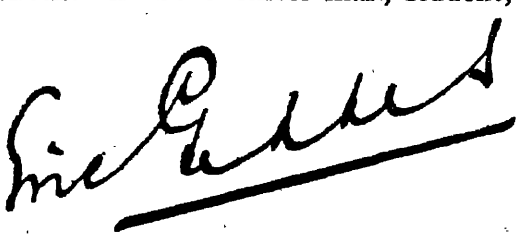
In the temperate climates the quickest means to both our objectives lies in the speedy increase of the white populations. Nothing is more striking in the figures given above than the quantity of British goods purchased per head of these great peoples. But it is useless to attempt to stimulate emigration from this country to the Dominions unless there is a real demand for the services of the migrants when they arrive. Such a demand will only arise *pari passu* with the development of the resources of the country concerned.

The deduction to be drawn from the above considerations is obvious. How the required results are to be pursued is a more difficult question. This is not the place, nor am I the person, to embark on questions of political controversy. I will only point out that, whatever method be adopted, accurate and comprehensive knowledge of the facts is absolutely essential. (All those who are engaged in business, either here or overseas, whether it be in finance, in production, in merchanting, in transport, or in insurance, should be informed of what the different parts of our great Empire can produce, and the conditions under which production must take place and those under which the produce can be brought to market. There should be a general knowledge, too, of the amount of foreign competition with which our products and materials have to contend.)

In all my experience, whether on the railways, in the turmoil of the Great War, in Government, or in commerce, I have been continually impressed with the vital importance of accurate and comprehensive statistical knowledge—and, I am afraid, too often impressed with the difficulty of getting it.

This Series is an endeavour to supply such information regarding our Imperial resources. It cannot, unfortunately, be maintained that the results are in every case all that one could wish. However, this very inadequacy is perhaps the clearest justification for the series. The fact that complete information cannot be given shows how necessary it is that all available information should be collected and made public. Only in this way can attention be called to what is wanting and the deficiencies made good. If the Series proves as successful as I hope it may, and believe that it will, it should become a permanent institution, and it should be possible gradually to make good what is now wanting in future issues, so that eventually we may have in it a standard work of reference, which should be indispensable to all those interested or engaged in Imperial commerce or development, whether he be business man, student, or administrator.

March, 1924.



INTRODUCTORY REVIEW

BY

STANLEY MACHIN, J.P.

No time could be more opportune than the present for a comprehensive survey of the Food Resources of the Empire. The world war from which we have recently emerged brought forcibly home to us the very great danger of allowing our own home supply of food-stuffs to decrease, and, unfortunately, post-war developments have brought us back once more to the perilous position in which the war found us. From the war, too, we learnt the very great importance of being able to draw adequate supplies from our own overseas territory and so not being dependent on any foreign country. Now that the war is over we are faced with new difficulties. Important foreign markets from which the world drew substantial portions of its food supply have been disorganized, grain has not been coming from Russia, nor sugar from Central Europe. At the same time the United Kingdom finds itself with a largely increased population to maintain, the actual number being approximately 1,800,000 more than in 1913, and that population, owing to the prolonged industrial depression, is suffering from a decreased purchasing power and the consequent inability to buy the necessities of life at their present enhanced values. When it is realized that this condition is coincident with an increase of industrial production in many important civilized countries, the comparison is all the more remarkable. The tendency in these countries is, therefore, towards a decrease in the production of food-stuffs whilst the demand is maintained, if not increased. All these considerations make it clear that it is of the utmost importance for us to develop the food production of those territories which are under our Imperial control. Fortunately, our position in regard to food-stuffs is fairly strong. This volume does not deal with food-stuffs of animal origin, in which direction we control the substantial portion of the world's production.

In regard to supplies of vegetable food-stuffs the position is also reasonably satisfactory and is fortunately susceptible of very great development. Full statistics of world production and of the production in the different portions of the Empire of various products will be found in the succeeding pages. But it will not be amiss to give a few figures here of the most important products, showing the percentage of world supplies borne by the British Empire production in the following: Wheat, maize, barley, oats, rice.

Product.	Production (Thousands of Tons). World.	Empire.	Percentage.
Wheat	89,195·5	25,645·8	28·75
Barley	28,427·8	6,099·5	17·16
Oats	53,541·2	10,724·7	20·03
Maize	106,112·0	4,215·2	3·97
Rice	79,146·6	51,715·5	65·34

When one considers the already large production of fruit and grain in Canada; the enormous potentialities of Australia with its area of 2,974,581 square miles, holding a population of only 1·83 (1921) per square mile, and of South Africa with its wonderful climate and fine supply of native labour; the huge proportion of world supplies of vegetable oils produced in our other African territories and the growing importance of these as a basis for production of margarine, it is clear that the realization of our ideal self-supporting Empire is by no means an impossible one, in so far as vegetable products are concerned. Unfortunately, production is not the only matter to be considered: distribution is equally important. Even in this country, where distances are small, according to the recent issued reports of the Linlithgow Committee the cost of distribution of our home produce is unduly large and prejudices our home producers in competition with imported produce. When one considers that Australian fruit and grain have to be carried 9,550 miles to compete in British markets with grain and fruit from America, only 3,043 miles' distance, the importance of cheap transportation and distribution becomes evident. This volume should, therefore, be studied in close conjunction with that on Communications which will be included in the Series, and a point well worthy of consideration is the possibility of an increased intertrading between the Overseas portions of the Empire in food-stuffs and other commodities. It is not possible in a volume of this size to go at all deeply into remedial measures. It is a commonplace that an effective migration scheme is essential for the development of our Overseas resources and the relief of our difficulties at home. Improvement of communications is also an essential condition. Irrigation is urgently necessary in some territories and improved methods of production in others. Nor is it within the scope of this Series to plunge into controversial questions such as have raged recently regarding the desirability of using fiscal measures for the protection and development of our Imperial food production. It is, however, necessary that these and other questions affecting the Empire as a whole should receive the very sympathetic consideration of the units of the Empire, so that the policy ultimately evolved will bring in its train the feeling of confidence and sense of reasonable security so necessary to free and mutually profitable intercourse. If this is done much may still be accomplished in the direction of the development of the resources of the Empire and the binding together of the British race, upon which our future as an Empire so largely depends.

There is one final remark that I would like to make in regard to this aspect of the question, and that is to call attention to the most sane and statesmanlike

utterances of Mr. Bruce, Prime Minister of the Commonwealth of Australia, in which he laid it down most clearly that Australia does not ask for any measures of assistance for Australian produce which would prejudice the development of the agricultural resources of the United Kingdom, but fully recognizes that so far as the people of this country are concerned the safeguarding of our own agricultural interests must come first. With such a spirit prevailing amongst the statesmen of our Overseas Empire surely there is good hope that we may arrive at a satisfactory solution of this all-important problem.

STANLEY MACHIN.

March, 1924.

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This Volume is Part I. of the author's work on Food Supplies of the British Empire. Part II. is a separate volume uniform with this, and deals with Livestock, Meat, Fish, and Dairy Produce. The author includes in the second part some conclusions of more general interest.

CROPS AND FRUITS

SECTION I

CHIEF FOODS OF VEGETABLE ORIGIN

THIS volume and the one which succeeds it in the Resources of the British Empire Series are concerned, respectively, with Food derived from Plants and Food derived from Animals, their chief aim being to present a summary of the available information in a form that will be of use to those concerned with producing or distributing the various products. The Empire extends over more than a quarter of the land area of the world, including every variety of soil and climate, and is inhabited by a similar proportion of the world's population. To feed those inhabitants without drawing upon the resources of other countries would be a comparatively simple matter if they were evenly distributed. This, of course, is very far from being the case. About three-quarters of the Imperial population live in India—226 to the square mile in British India, and 101 to the square mile in the Feudatory States. Over 47 millions are crowded into the United Kingdom, 389 to the square mile. On the other hand, the density of population for Australia's 5½ millions is only 1·87 per square mile. The last figure, however, is to some extent misleading, for it ignores the fact that a considerable proportion of the island continent is not suitable for settlement. The same applies to some other parts of the Empire, especially Canada and some regions of British Africa.

An old and closely settled country, such as the United Kingdom, naturally passes into the manufacturing stage, and the production of certain kinds of food tends to decline, especially when these can be easily and cheaply imported in exchange for manufactured articles. The ordinary consumer buys at the lowest price offered, and does not as a rule concern himself with the origin of the commodities he requires. It follows that food production, in a given country, may fall to such a dangerously low level that a prolonged war might mean starvation. A self-feeding Empire is consequently an ideal that appeals to many, especially as it is bound up with the question of markets for our manufactures, but its realization primarily depends on economic factors. No one can be expected to engage in producing food, or indeed anything else, unless it pays him to do so, and it is for the British Empire to decide how far its own food production should be put on an economic basis, and to what extent it is wise and safe to rely on imports from foreign countries. From the point of view of National Defence the food question is most acute in the case of the United Kingdom and certain places of strategic importance, such as Gibraltar and

Aden, which would starve without imported food. The Dominions and Colonies, so far, produce a sufficient quantity of essential food-stuffs to keep them going in the event of war. The industrialization of some of them, however, such as Canada and Australia, is steadily advancing, and unless food production be made a reasonably profitable occupation there is a danger that they may produce a diminishing surplus of exportable food for the benefit of the Empire, and ultimately come to rely upon the importation of foreign cereals, etc., produced by the employment of cheap labour. Even now, in Australia and New Zealand, for example, there is an " urban drift," telling against agricultural development.

This volume is only concerned with presenting the main facts regarding Plant Food, while the second volume will do the same thing in respect of Animal Food, thereby furnishing material that may prove useful in the solution of a vitally important but difficult problem.

SURVEY OF BRITISH EMPIRE CROPS AND CROP PRODUCTS

The chief crops and crop products of the British Empire will now be briefly reviewed, Empire acreage and production being compared, whenever reliable figures are available, with world acreage and production, and Empire exchange being compared with foreign imports. Space precludes detailed consideration of everything included in the list which follows, and most attention will be given to products of primary importance, such as wheat, barley, oats, maize, and sugar, for which incomplete data are available in the statistical publications of the International Agricultural Institute at Rome.

Classification of Crops and Crop Products.

I. Grain Crops and Grain Products.—Wheat, wheat-meal and flour, offals. Barley, barley-meal, and malt. Oats, rolled oats, and oatmeal. Rye. Maize, maize-meal, cornflour, etc. Rice, rice-meal, etc. Millet. Kaffir corn.

II. Root Crops.—Turnips and swedes. Mangels. Potatoes. Sweet potatoes. Yams. Cassava and tapioca. Arrowroot.

III. Pulse Crops.—Peas. Beans. Lentils. Other pulses.

IV. Grass Crops.—Permanent pasture. Temporary pasture. Grass and clover grown for seed. Hay. Ensilage.

V. Forage Crops.

VI. Sugar Crops.—Sugar beet and beet sugar. Sugar cane, cane sugar, molasses, etc. Maple sugar.

VII. Fruit.—1. *Fresh Fruit.*—Apples. Pears. Table grapes, plums, apricots, peaches, and other soft fruits. Oranges, lemons, and other citrus fruits. Bananas, pineapples, etc. 2. *Dried Fruit.*—Raisins. Currants. Other dried fruits. 3. *Canned Fruits.* 4. *Jams and Jellies.* 5. *Fruit Juice and Syrup.*

VIII. Edible Nuts (as human food).—Almonds. Walnuts. Other edible nuts.

IX. VEGETABLES (fresh, dried, and preserved).—Onions. Tomatoes. Other vegetables.

X. MISCELLANEOUS.—Buckwheat. Sago. Biscuits, various prepared cereals, etc., and confectionery. Oils and oil residues (Olive and other oils. Oil cakes. Cocoa butter). Various stock-foods.

XI. POTABLE ALCOHOL, ETC.—Spirits, liqueurs, and cordials. Malt liquors. Cider and perry. Wine. Vinegar. Mineral waters.

I.—GRAIN CROPS AND GRAIN PRODUCTS.

1. WHEAT.—Considering that this cereal provides the staple bread-stuff for the white population of the Empire, it may well be regarded as the most important crop, and any serious decline in production gravely affects the agricultural industry as a whole, and adds to an already large dependence on foreign countries for supplies. The following figures are for 1922-23:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
238,703·3	64,056·7	89,195·5	25,645·8

The Empire produces enough wheat for its own requirements, but as a good deal is exported to foreign countries a deficiency is created which has to be made good by importation from such countries, especially the U.S.A. and the Argentine.

Wheat-Meal and Flour.—Part of the wheat crop for which the totals have been given above is converted into these forms before being imported or exported. The great bulk of wheat in proportion to its weight—and the same is true for all kinds of grain—adds materially to the cost of transport, especially by land. As 100 pounds of wheat yield about 72 pounds of flour, which is of greater value, there is a 28 per cent. reduction in the weight to be handled with substantial reduction in bulk. The retention of bran and other offals is also an obvious advantage to an exporting country in which the live-stock industry is being developed.

One factor that has contributed to the decline of wheat-growing in the United Kingdom is the shifting to the seaboard that has taken place of the chief mills, in order to deal directly with imported grain without previously incurring heavy charges for carriage by rail. This has resulted in the disappearance of most of the small inland mills. The consequent absence of local facilities for converting part of the wheat crop into flour has undoubtedly acted as a deterrent to wheat-growing.

Wheat Straw.—A crop yielding 32 bushels per acre produces about 30 hundredweights of straw. This is chiefly valuable for the bedding and fodder of stock, and is also employed for thatching, etc. Some kinds are of special value as raw material for the straw-plaiting industry. The straw of wheat and other cereals is so extremely bulky that the cost of carriage is prohibitive, and it is consequently scarcely worth consideration in connection with imports and exports.

2. BARLEY.—This is far less important than wheat as a cereal crop, but some of its products, such as pearl and Scotch barley, figure in the Empire dietary, while barley-meal is largely employed in pig-feeding. The crop, however, is chiefly grown for malt production, and its cultivation for this purpose is notoriously difficult and expensive. The residues from the brewing industry —malt sprouts, malt culms, brewers' grains, etc.—are much used as artificial foods for stock. Barley is also the most important grain for the production of pot-still whisky, particularly that distilled in Scotland. The following figures are for 1921:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
64,673·6	12,144·3	28,427·8	6,099·5

There is a tendency for barley production in the Empire to fall below Empire requirements, largely as a result of reduction in output from the United Kingdom.

Barley Straw is less valuable than wheaten straw for fodder and litter. An average English crop yields about a ton per acre.

3. OATS.—In respect of acreage and total value of produce this ranks high among the world's grain crops, while it is the most important for the United Kingdom. Cultivation is comparatively cheap and easy. The grain is richer in proteins and fats than that of other cereals, and is consequently of great value as human food (oatmeal, rolled oats, etc.), and for feeding all kinds of stock. The following figures are for 1921:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
124,511·3	20,333·4	53,541·2	10,724·7

Oat Straw is more nutritious as a stock-food than wheat or barley straw. For average crops in the British Isles the yield is 30 to 35 hundredweights per acre. Empire production of oats fluctuates, sometimes equalling requirements, but at other times falling below these.

4. RYE.—The world production of this cereal is rather greater than that of barley, but it occupies a subordinate position as an Empire crop, its grain being little used as a bread-stuff, though employed for distillation. Rye-meal, however, is a valuable stock-food. The crop is particularly easy to cultivate and thrives on poor soil unsuitable for other cereals. On the other hand, its liability to attack by ergot is a serious drawback. The following figures are for 1921:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
92,814·5	2,347·9	33,148·1	893·3

Rye Straw is poor as a feeding-stuff, but valuable as litter. It is also employed for several industrial purposes. The yield is about 1½ to 2 tons per acre for average British crops.

5. MAIZE.—This cereal, were complete statistics available, would probably come third as regards world production, and is particularly typical for the United States. The greater part of that raised in the British Empire is cultivated in the Union of South Africa, Canada, and Australia. Maize was originally valued for the production of human food, and is still largely employed for that purpose. Its importance in this respect for the British Empire is chiefly with regard to the natives of Africa. As might be expected for a cereal of American origin, it is more favoured by the white population of the United States than by our own, by whom it is chiefly consumed in the form of cornflour, maizena, and similar products. Being deficient in gluten the grain is unsuitable for bread-making except when mixed with flour derived from other cereals. Maize and maize-meal are important stock-foods and are in increasing demand for that purpose. The grain is largely used in the poultry industry. Maize is also employed in distillation and for the production of acetone. The following figures are for 1921:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
170,775·2	76,632·6	106,112·0	4,215·2

Empire maize production falls far below Empire requirements.

6. RICE.—As regards world acreage and world production this is by far the most important cereal, and furnishes the staple food of many millions of the native races in the warmer countries. Finely powdered rice is employed in the manufacture of toilet preparations, and rice is also a source of potable alcohol in the form of arrack or rice spirit. Rice-meal is used to some extent as a stock-food, but contains little nutritious matter except starch and is of inferior manurial value. (China and Siam not included in the following figures for 1921. Total world production probably 196,840 thousand tons.)

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
123,008·8	83,698·7	79,146·6	51,715·5

Rice Straw is employed for fodder and other agricultural purposes, and is also plaited into hats, shoes, etc.

Empire rice production is more than equivalent to Empire requirements, and a large surplus is available for export to other countries.

7. KAFFIR CORN.—This cereal is indigenous to South Africa, and is cultivated for the same purposes as maize, to which it is little inferior. The name also includes durra, a North African variety of the same species (*Sorghum vulgare*). Over thirty years ago this crop was introduced into the semi-arid regions of the western United States, where maize had proved a failure, and has now for

the most part replaced that cereal there, its yield being much more certain. A great future is anticipated for Kaffir corn in the Union of South Africa, where some of the improved American varieties have found favour, more particularly for helping to develop the live-stock industry in areas where the rainfall is deficient. (*See* Section II., Union of South Africa.)

8. MILLET.—This name is applied to a number of cereals largely grown, especially for human food, in some of the warmer countries, on all sorts of soils and under varying climatic conditions. They are of great importance in those parts of India unsuitable for the cultivation of rice. Millet is also extensively grown in Egypt. (*See* Section II., British India and Egypt.)

II.—ROOT CROPS.

1. TURNIPS AND SWEDES.—The introduction of the turnip into British agriculture in the eighteenth century, together with the practice of drilling seed, revolutionized farming by removing the necessity for bare fallow, greatly increasing production, and rendering possible the systematic winter feeding of stock. Swedes are simply a hardy variety of turnip, so called after the country of origin, a packet of seed having been sent from Gothenburg to Scotland in 1777.

The crop is largely grown in countries possessing a temperate climate, and within the British Empire is more particularly typical for the United Kingdom and New Zealand.

2. MANGELS.—The mangel (wurzel) or mangold (wurzel) is an important root-crop which has largely replaced the turnip for feeding cattle, being more nutritious—with a high sugar content, less affected by drought, less liable to the attacks of fungoid and insect pests, and superior in keeping qualities. That such marked differences should exist is not surprising when it is remembered that the mangel does not belong to the same family (Cruciferæ) as the turnip, but to the one (Chenopodiaceæ) which includes the sugar beet and garden beet.

3. POTATOES.—The fact that this crop surpasses wheat when judged by total annual weight of world production sufficiently attests its importance, especially when it is remembered that the amount raised in gardens is not included in the figures that follow. The original home of the potato appears to have been in western South America, from which it gradually spread, as a food-plant, into North America. It was first introduced into Europe as a curiosity, but its value began to be realized in the later part of the eighteenth century, and it is now an indispensable source of starchy food in temperate countries, being very adaptable to varying soils and climates, though unfortunately liable to a great variety of diseases. Potatoes are also employed as stock-food, and furnish raw materials for starch production and distillation, while the residues from both these industries are fed to various farm animals, more particularly on the Continent. The following figures are for 1921:

ACREAGE. (Thousands.)		PRODUCTION. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
33,194·2	2,278·9	109,946·6	10,087·5

Empire production of potatoes equals Empire requirements, and there is some export to other countries.

4. CARROTS.—These are grown as a minor field crop for the production of stock-food, and for this purpose are superior to swedes. They are particularly suitable for horses and pigs, but as the cultivation is difficult and the yield uncertain, they are not likely to secure a prominent place in arable farming.

5. PARSNIPS.—These are even less important than carrots as a field crop, though the roots are valuable as cattle food.

6. FIELD CABBAGES, KOHL RABI, ETC.—Although crops of this kind are not grown for the sake of their roots, they are usually classified with the "root crops" with which they agree in method of cultivation and place occupied in a rotation.

7. SWEET POTATOES.—The sweet potato (*Batatas edulis*) belongs to the convolvulus order (Convolvulaceæ), and not to that (Solanaceæ) including the ordinary potato. It constitutes an important article of human food in some of the warmer parts of the globe, being cultivated, for example, in China, Japan, India, South Africa, and the West Indies. The tubers are used to some extent for stock-food, while young shoots are valued as fodder for horses and cattle.

8. YAMS.—The yam, notable for the enormous size of its tubers, is cultivated in some tropical countries for the purposes served in temperate regions by the potato crop.

9. CASSAVA.—This crop plant, of South American origin, is cultivated in many tropical countries for the sake of its large tubers. A distinction is drawn between Bitter Cassava (*Manihot utilissima*) and Sweet Cassava (*M. palmata*), of which many varieties are grown. The tubers of the latter can be eaten when fresh, but those of the bitter kind, which is of much greater importance, are poisonous, and are specially prepared for conversion into starchy food-stuffs, among which tapioca is a well-known article of commerce.

10. ARROWROOT.—Several species of tropical and semi-tropical plants are cultivated for the production of the starchy food known by this name. The parts of the British Empire chiefly concerned are the West Indies, the Bermudas, India, and Queensland.

III.—PULSE CROPS.

The pulses of leguminous crops are of importance on account of the highly nutritious character of the seeds, which are particularly rich in nitrogenous compounds, and are therefore of value as human food and also for stock-feeding purposes.

1. PEAS.—A moderately important crop in the temperate parts of the Empire.

Split Peas, Pea-Meal, etc.—Import and export are largely in these forms.

Pea Straw is more nutritious and more digestible, as fodder, than the cereal straws, but is particularly liable to be rendered unpalatable by fungoid infestation. The amount harvested per acre for a crop of from 32 to 36 bushels is 1 to 1½ tons.

2. BEANS.—A considerably larger acreage is devoted to this crop than to peas in the temperate parts of the Empire.

Bean-Meal, etc.—The tropical "Java beans," "Rangoon beans," etc. (varieties of *Phaseolus lunatus*), possess poisonous properties, and bean-meal containing them should be avoided.

Bean Straw possesses the valuable feeding properties of pea straw, but has the same drawbacks (see above), besides which it is coarser and more difficult of digestion. The yield per acre for a crop of 25 to 40 bushels varies from 25 to 30 hundredweights.

3. LENTILS.—These are widely cultivated as a pulse crop, being particularly characteristic for some of the warmer countries, such as India and Egypt, as detailed in Section II.

4. CHICK PEAS.—These are grown in South Europe for human food, and are extensively cultivated in India ("gram"), Egypt, etc. The shoots are used as fodder.

5. SOY BEANS.—These are extensively grown in most tropical countries for human food and oil production (*see* Volume X.), the residue from the latter being also very valuable for stock-feeding purposes. Varieties which thrive in a temperate climate have also been raised, so that the area of cultivation is likely to undergo considerable extension.

6. GROUND NUTS.—Also known as earth nut, monkey nut, and pea nut, this is a pulse (not a "nut") of which the pods ripen underground, and which is extensively grown in West Africa and South Asia for the production of oil (*see* Volume X.). The residue is a valuable stock-food.

IV.—GRASS CROPS.

The word "grass" is employed in the agricultural sense, as applied to the mixed herbage (grasses, clovers, etc.) of meadows and pastures. This is either grazed by stock, or cut for conversion into hay or ensilage. Grass crops are of primary importance in the pastoral industry, as they provide the chief raw material for stock-raising.

1. PERMANENT GRASS.—Here is included land artificially sown for the production of permanent pasture, used for grazing or haying.

2. TEMPORARY GRASS.—This is sown to take its place in a rotation. In some parts of the Empire—Australia, for example—cereals are largely employed for this purpose.

3. SEED GRASS, CLOVER, ETC.—Some details are given in Section II.

4. HAY.—The bulk of this is made from mixed herbage, but a crop specially sown for haying may consist of one grass, mixed grasses, a clover, mixed clovers, cereals, or some other fodder plant such as lucerne (alfalfa), sainfoin, etc.

5. ENSILAGE.—As a substitute for roots in winter feeding this finds increasing use in agriculture, and it is of particular value in wet seasons by preventing the loss of herbage that would normally be converted into hay.

V.—Forage Crops.

Here are included a great variety of crops grown for the production of green fodder. They are mostly leguminous (vetches, lucerne, sainfoin, lupins, etc.), but also embrace cereals and grasses that are not allowed to ripen, such crucifers as rape and mustard, prickly comfrey, chicory, etc.

VI.—Sugar Crops.

1. Sugar Beet.—This is a root crop, closely allied to mangel, cultivated for sugar production in temperate regions. Its value was first recognized on the Continent, but the amount grown in the British Empire is steadily increasing, particularly in Canada. Experiments are in progress in England. The following figures are for 1922:

Acreage. (Thousands.)		Production. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
3,649·1	30·7	35,874·2	241·6

Beet Sugar.—The residues are valuable for feeding stock.

	Production (Thousands of Tons).		
	1913.	1921.	1922.
World	8,556·2	819·6	4,902·9
Empire	14·1	45·9	28·5

2. Sugar Cane.—The leading world crop for sugar production, this has suffered greatly by the competition of the sugar beet. It is of prime importance for the tropical and subtropical parts of the British Empire, and there are large possibilities by way of further development. Mauritius, the West Indies, British Guiana, and Queensland are the most important producers at the present time. The residues, especially molasses, are valuable as human food, for the distillation of rum, and for stock-feeding. The following figures are for 1922:

Acreage. (Thousands.)		Production. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
5,551·1	2,993·6	Statistics not available.	

Cane Sugar.—Empire production is far below Empire sugar requirements, but the decline of the Continental beet industry affords an opportunity of replacing foreign beet sugar by Empire cane.

	Production (Thousands of Tons).		
	Average 1909–10 *to* 1913–14.	1920–21.	1921–22.
World	9,399·5	12,507·8	13,202·●
Empire	3,168·1	3,412·5	3,573·9

VII.—Fruit.

It is generally recognized that a rational diet should include fruit, and its consumption per head in closely settled countries has been steadily increasing. Up-to-date methods of grading, packing, preserving, etc., add considerably to the value of the produce and are coming into general use, but their importance has only of late years been fully appreciated by Empire producers in general. Some countries are fully alive to the desirability of utilizing the natural supply of wild fruits so far as possible, Sweden setting a very good example in this respect and introducing instruction on the subject into the national scheme of rural education.

1. Fresh Fruit. (*a*) *Apples.*—These take the leading place. Canada and Australia are the most important producing Dominions. A small proportion of the crop is used for cider production.

(*b*) *Pears.*—These occupy a subordinate position in comparison with apples. A very small part of the crop is used for making perry.

(*c*) *Soft Fruits: Table Grapes.*—The best of these, in temperate climates, are hothouse grown, but in warmer countries their production, on a large scale, is a branch of the vineyard industry.

Other soft fruits (plums, cherries, peaches, apricots, small fruits, etc.) are raised in considerable quantities in the United Kingdom, Canada, Australia, New Zealand, and South Africa.

(*d*) *Citrus Fruits* (Oranges, Lemons, etc.).—The West Indies, India, and South Africa are the chief Empire producers, and citrus-growing in the last named is undergoing rapid expansion.

(*e*) *Bananas.*—Jamaica is the chief Imperial source of supply for the United Kingdom, and Queensland is becoming of increasing importance in this respect. Bananas are also grown on a commercial scale in the Union of South Africa, and they are among the products of several other parts of the Empire.

(*f*) *Pineapples.*—The West Indies are the chief Imperial source of fresh pineapples imported into the United Kingdom, most of those grown in Queensland and British Malaya being canned for export.

2. Dried Fruit. (*a*) *Raisins.*—The United Kingdom mainly relies on foreign countries, including Egypt, as sources of supply, but production is being successfully developed in Australia and South Africa. In such cases the cultivation of grapes suitable for drying is an important branch of the vineyard industry.

(*b*) *Currants.*—*See* remark made regarding raisins.

(*c*) *Figs.*—These are mostly imported into the United Kingdom from Asia Minor.

(*d*) *Dates.*—These are mainly the product of North African countries, including Egypt. There is some export from the Sudan.

(*e*) *Other Dried Fruits.*—Here are included apples, plums, peaches, etc.

3. Canned Fruit.—Fruit-canning is on the increase in several parts of the British Empire, including Canada, Australia, and British Malaya.

4. JAMS AND JELLIES.—The consumption of these commodities has increased greatly of recent years, and their production is associated with the fruit industry in many parts of the Empire, especially as transport is easy.

5. LIME JUICE AND FRUIT SYRUPS.—Our supply of lime juice mostly comes from the West Indies. Fruit syrups are much less in demand in the Empire than in some foreign countries, such as France, but the increasing popularity of fruit and fruit products suggests that there may be a commercial future for them, especially in cases where the consumption of potable alcohol is on the decline.

VIII.—EDIBLE NUTS.

The chief use of nuts is for oil production (*see* Volume X.), and here we are only concerned with them as employed for human food.

1. ALMONDS.—The sweet almonds (*Amygdalus dulcis*) consumed in the United Kingdom are mainly imported from South Europe, the Levant, and California, but parts of the British Empire are well suited for their cultivation, and development in this direction is being attempted in South Africa and elsewhere.

2. OTHER EDIBLE NUTS.—A great variety of these are grown in various parts of the Empire, but the supply is largely from foreign countries.

IX.—VEGETABLES.

Fresh vegetables form an indispensable part of a rational diet, but their bulky and perishable nature unfits them for transport over long distances. They are consequently produced in all parts of the Empire in sufficient quantity to meet local demands. To this, however, onions and tomatoes afford exceptions, and both are exported and imported on a considerable scale, in certain cases.

Vegetables when dried, canned, or otherwise preserved, easily lend themselves to transport, and their preparation in these forms is an industry of increasing importance. Preserved vegetables, however, are deficient in vitamines, and are therefore an imperfect substitute for the fresh commodity. But they are convenient, and useful in emergency, besides enabling the enjoyment of such luxuries as asparagus or truffles when these are out of season.

X.—MISCELLANEOUS.

1. BUCKWHEAT.—This is not a cereal, as its name would suggest, but a member of the rhubarb family (Polygonaceæ). It is largely grown in some countries as a bread-stuff, is of value for stock-feeding, and particularly useful in the poultry industry. A large area in Canada is under this crop (*see* p. 90).

2. SAGO.—The starchy food to which this name is applied can hardly be described as an agricultural crop, being rather a wild production. The best kind is derived from the inner part of the trunk of the sago palm (*Metroxylon sagu*), and is produced in the Malay region and the East Indies. Inferior grades are procured from other trees growing in the same part of the world, India, the West Indies, and America. Singapore is our chief emporium for sago,

partly the produce of the Straits Settlements and partly of foreign origin (Dutch East Indies).

3. Biscuits, Various Prepared Cereals, etc., and Confectionery.—Some of the important worked-up products of particular grain crops have already received mention, but as several of these grains, some pulses (especially lentils), and a great deal of sugar are used in the manufacture of various prepared foods, these are conveniently placed under a general heading. Details will be found in Section II.

4. Oils and Oil Residues. (*a*) *Oils.*—The chief use of oils for edible purposes is in the preparation of the butter substitute, margarine, defined in the Margarine Act of 1887 to include "all substances, whether compounds or otherwise, prepared in imitation of butter, and whether mixed with butter or not." By subsequent legislation the name was limited to preparations containing not more than 10 per cent. of butter fat. Animal fats alone were originally employed in the manufacture of this substance, but vegetable oils are now largely substituted, 57½ to 67½ per cent. of the compound consisting of hard oils (chiefly coconut and palm-kernel oils), and 15 to 25 per cent. of soft oils (mainly cotton-seed oil and ground-nut oil). Of other edible oils the most important are olive oil and soya oil, while cotton-seed oil is largely employed in the preparation of food, more particularly for frying fish. Oleo-margarine, or "oleo," is the mixture of oils worked up in the manufacture of margarine. Since butter substitutes are of mixed origin, often containing a proportion of butter and other animal fats, they will be dealt with in the second part of this volume, in connection with dairy products.

Cocoa butter is also an important commodity, employed in the manufacture of confectionery, and for some industrial purposes.

(*b*) *Feeding Cakes prepared from Oil Residues.*—Here are included a large variety of "artificial" foods (linseed cake, cotton cake, soya-bean cake, etc.) of great importance in the live-stock industry. Details are given in Section II.

XI.—Potable Alcohol.

This volume is only concerned with alcoholic beverages, lime juice and fruit syrups, and table waters. Tea, coffee, and cocoa are dealt with in Volume IV. of the Series.

1. Spirits, Liqueurs, and Cordials—(*a*) *Brandy.*—This is distilled from grape wine and the by-products of the wine industry. The name is also applied to whisky flavoured so as to resemble brandy proper. The British Empire mainly relies on foreign countries, specially France, for its supplies, but brandy is also produced by Australia and South Africa, and this industry is susceptible of considerable development.

(*b*) *Whisky.*—This spirit is distilled from grain (barley, oats, rye, maize, etc.) and malt, sometimes with an admixture of potato. Empire production more than equals Empire requirements, but much of the barley used is of foreign origin. Its production is particularly distinctive for the United Kingdom (Scotland and Ireland), and a considerable quantity is distilled in Canada.

(*c*) *Gin.*—This is distilled from malt and grain, and specially flavoured. A considerable quantity is imported from foreign countries.

(*d*) *Rum.*—As a spirit distilled from molasses this is a typical product in countries where the sugar cane is grown, and the Empire supplies are chiefly derived from the West Indies and British Guiana.

(*e*) *Other Spirits.*—The most important of these is arrack or rice spirit, which is among the products of India, etc.

(*f*) *Liqueurs and Cordials* (Alcoholic).—These are mostly imported by the British Empire from foreign countries, but some of them (sloe gin, cherry whisky, etc.) are home produce.

(*g*) *Distillery residues* are used for feeding stock.

(*h*) *Yeast.*—It is a matter of common knowledge that this substance (consisting of innumerable colourless microscopic plants) breaks down sugar in solution into simpler compounds, including alcohol—*i.e.*, sets up alcoholic fermentation. "Wild" yeasts are present almost everywhere as a constituent of dust, which accounts for the fact that fruit juices and other liquids containing sugar in solution ferment sooner or later with production of alcohol. The yeast cakes of commerce are mostly a by-product of the distilling industry. This commodity is not only employed to obtain alcohol, but also in bread-making. Carbonic acid gas is one of the compounds formed when sugar ferments, and causes the spongy texture that distinguishes "leavened" from "unleavened" bread. Extracts of yeast are used as a "relish," and for other purposes.

2. Malt Liquors.—These include ale, beer, and stout, which are the most typical alcoholic beverages of the Empire. Some of the production figures are given in Section II. The chief raw materials are *malt* and *hops*. The former is produced by allowing barley to sprout or germinate under controlled conditions of moisture and temperature, the result being that the starch contained in the grain is converted into malt sugar, which is subsequently used for production of alcohol by the agency of yeast. Empire barley is mostly grown for malting purposes, the English grain being of unrivalled quality for the purpose. A considerable amount of malting barley and malt are imported from foreign countries, but the Empire is more than able to produce a sufficient amount of these commodities for its own consumption. Malt extract is a subsidiary product largely consumed as what may be termed "medical food." Malt residues are used as stock-foods.

Hops, employed for bittering malt liquors, are cultivated to a considerable extent in the United Kingdom, Canada, Australia, and New Zealand, but are also imported from foreign countries. The following figures are for 1920-21:

Acreage. (Thousands.)		Production. (Thousands of Tons.)	
World.	*Empire.*	*World.*	*Empire.*
116·1	27·8	35·8	12·9

3. Cider and Perry.—The consumption of these beverages is very largely local, but improved methods of production are enhancing their popularity, and

a considerably increased consumption may be anticipated in consequence. Outside the Empire only France and Germany are important producers.

4. WINE.—Apart from standard luxury wines imported from foreign countries, especially France, Spain, and Portugal, the consumption is comparatively small in the United Kingdom and other parts of the Empire. That wine, as an ordinary daily beverage, will replace malt liquors and cider to any very large extent seems hardly probable. Wine from some of the Dominions, however, is being consumed in increasing amount, and our dependence on foreign countries should ultimately be considerably reduced. Australian wines have attained marked popularity, and South Africa, long known as a wine-producing country, is making vigorous efforts to secure a share of the trade. For 1921 the vineyard acreage (thousands) was 16,020·1 for the world and 180·1 for the Empire. During the same year the world production of wine amounted to 2,786,447,978 gallons, that of the Empire to 34,834,629 gallons.

The brief survey of food-stuffs which has now been given demonstrates that all are produced within the Empire, and further facts could be adduced to show that this production is on the increase in many cases. In 1922, for example, Canada was the world's foremost exporter of wheat, and her crops of wheat, barley, and oats for 1923 were the largest in her history. But we must not forget that the yields of both years were unusually bountiful. Empire production falls short of Empire requirements, however, as regards certain commodities, of which the most important are sugar, maize, and wine.

The undeveloped Imperial resources are practically boundless for every kind of plant produce, and indeed as regards products of every sort and kind. At any rate, it would be possible, by organizing and developing our food resources, to realize the ideal of a self-feeding Empire. During the War we saw what could be done by way of increasing food production even in a closely settled country like the United Kingdom, and the potentialities in this direction of such parts of the Empire as Australia and South Africa are so large that their full extent is difficult to realize.

Section II. of this volume will deal, in succession, with the different parts of the Empire, as regards their shares in the production of the commodities already enumerated, their needs and how they are satisfied, and the disposal of their surplus by inter-Empire and foreign trade. It will be convenient to adopt the usual main geographical headings of Europe, Asia, Africa, America, and Australasia. Egypt is so new a self-governing and independent country, and its connection with the British Empire has been so intimate, that it will be included in the African subsection, especially as the chief statistics given are for 1913-14 and 1921-22. The mandated territories of Iraq, Palestine, and some of the Pacific Islands, on the other hand, are treated as foreign countries.

Section III. consists of a Summary and General Conclusions.

SECTION II

PRODUCTION, IMPORT, AND EXPORT OF FOOD OF VEGETABLE ORIGIN IN THE BRITISH EMPIRE AND THE KINGDOM OF EGYPT

EUROPE

UNITED KINGDOM

(As the term "United Kingdom" is technically correct for the period under review, it is retained throughout for the sake of convenience, especially as available statistics appear under this heading. Any endeavour, at the present time and for the particular end in view, to deal with the Irish Free State as a distinct Dominion would only result in confusion.)

Total area, 76,641,609 acres. Under crops and grass (not including natural grazing): 1913, 46,740,904 acres; 1922, 45,458,000 acres; arable (Great Britain): 1913, 14,360,187 acres; 1922, 14,648,583 acres; permanent grass: 1913, 27,309,188 acres; 1922, 16,102,709 acres.

The increase in population during the last sixty years, as estimated in the census returns, may be expressed in round numbers (millions) as follows: 1861, 29¼; 1871, 32; 1881, 35¼; 1891, 38; 1901, 42; 1911, 45¼; 1921, 47. During this period the country has been increasingly industrialized, and there has been a corresponding decline in crop production, hastened by the competition of imported plant food-stuffs, produced more cheaply than those grown at home, and consequent fall in prices. Expressed in thousands of acres, the following figures give the facts regarding the shrinkage in the area of arable land: 1870, 23,997; 1880, 22,772; 1890, 20,830; 1900, 19,432; 1910, 19,507 (the small increase was due to a change in the method of calculating the Irish acreage; there was a distinct falling off for England, Wales, and Scotland); 1913, 19,339. The crop statistics given do not include the Isle of Man; and Channel Islands.

[Irish figures for total arable and permanent grass not available since 1917.]

I.—Grain Crops and Grain Products.

Overseas competition has been most acute in the case of cereals, owing to the exploitation of vast unexhausted areas not requiring the application of intensive methods of production. Grain and grain products also lend themselves to cheap sea transport.

1. Wheat.—This crop has suffered most in the decline of arable farming, and will be realized by inspecting the following figures, expressed in thousands

of acres, for the years already dealt with as regards total arable: 1870, 4,141; 1880, 3,059; 1890, 2,480; 1900, 1,900; 1910, 1,857; 1913, 1,791; 1922, 2,073. Here, and elsewhere, no account will be taken of the abnormal increases of cultivation during the War.

The last very large crop of home-grown wheat was grown in 1868, when the yield was, in round figures, 16½ million quarters, sufficing for slightly over two-thirds the needs of the then population of under 30 millions, and leaving only 8 million quarters to be imported. By 1880 the reduction in wheat acreage necessitated the importation of two-thirds of our total requirements. The figures which follow for 1913 and 1921 tell their own tale, and throw some light on the acute wheat crisis now existing.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre.*		*Imports (Thousands of Tons and £).*	
			Bushels.	*Cwts.*	*Empire.*	*Foreign.*
1913 ..	1,790	1,576	31·7	17·6	2,536,843 (£21,252,340)	2,757,062 (£22,596,833)
1921 ..	2,084	2,065	35·4	19·8	1,899,857 (£33,323,856)	2,124,083 (£37,282,212)

At the present time about 40 per cent. of the imported wheat is of Empire origin. The figure is possibly higher, for it is probable that a part of the shipments from the U.S.A. consists of reconsigned Canadian wheat.

Even though imports from other parts of the Empire should be largely increased in the future, the next world war will endanger *all* our sea-borne food, and we may be starved out unless in the meantime something effective has been done to increase the supply of home-grown wheat. It is simply a matter of National Insurance, and expenditure in this direction would appear to be as essential as the unproductive expenditure on the Army, Navy, and Air Force. We cannot rely with confidence on being able to increase production in the same way that we did during the late War. Even then the emergency measures taken barely sufficed, though the factor of time was on our side. A short, sharp, ultra-scientific war would afford no opportunity for growing extra crops.

The average yield of wheat per acre varies greatly in different countries, the degree of intensity of cultivation being one important factor, while loss can be more or less reduced by keeping down fungoid and insect pests (as in crops of all kinds), and much may be hoped by the introduction of rust-resisting wheats. Weather, of course, is beyond our control, and there will always be good and bad years.

In 1920 the average yield, expressed in bushels per acre, was 28·8, but this was surpassed by Denmark (41·0), the Netherlands (38·0), Belgium (33·6), New Zealand (31·2), Switzerland (30·2), and Sweden (29·2). The figure for the U.S.A., easily the first wheat-growing country in the world so far as total yield is concerned, was only 13·6, which was surpassed by Australia (16·1), and Canada (14·4).

The effect of the competition with imported wheat is clearly seen if the average price per quarter of home-grown grain (England and Wales) is given for a series of years, as follows: 1871, 56s. 8d.; 1881, 45s. 4d.; 1891, 37s.; 1901, 26s. 9d.; 1911, 31s. 8d.; 1913, 31s. 8d.; 1921, 71s. 6d.; 1922, 47s. 10d. Under present conditions it costs 55s. per quarter to produce home-grown wheat—about the same as the average market price in 1861 (55s. 4d.), when the cost of production was very much less.

Much of the imported grain is superior to home-grown wheat for milling purposes, and consequently fetches a higher price, this being particularly true for No. 1 Northern Manitoba.

Wheat Meal and Flour.—A bushel of British wheat weighs 60 pounds, but in the process of milling about 28 per cent. of this is accounted for by the offals, so that the corresponding weight of flour amounts to 43·2 pounds. The offals possess a considerable value for stock-feeding purposes. These are, of course, retained by flour-exporting countries.

Our imports for the years named, and also of prepared wheat, were as follows (in thousands of tons and £):

	Wheat Meal and Flour.		*Prepared Wheat.*	
	Empire.	*Foreign.*	*Empire.*	*Foreign.*
1913	226 (£2,451)	373 (£3,897)	—	4 (£92)
1921	364 (£8,796)	428 (£10,268)	1 (£68)	3 (£184)

Over 60 per cent. of the wheat flour imported in 1922 came from the Dominions.

Our present position with reference to wheat is summarized as follows (pp. 11 and 12) in the "Report on Cereals, etc.," of the Departmental Committee on Distribution and Prices, some of whose findings are quoted elsewhere: "The bulk of the grain required for human consumption is obtained from overseas. The Ministry of Agriculture estimates that in the cereal year ended August 31, 1922, out of a total supply in Great Britain of 6,930,000 tons of wheat (including imported wheat flour expressed in terms of wheat), no less than 4,903,000 tons, or 71 per cent., were imported from abroad. Moreover, it is estimated that only about two-thirds of the home supplies of wheat find their way to the mill, the remainder being used for seed, poultry food, etc., while, on the other hand, practically the whole of the imports of wheat are used for manufacturing flour. Hence the proportion of imported wheat used in the manufacture of flour and bread in Great Britain is even greater than the 71 per cent. already quoted, being, roughly, about 80 per cent. of the total consumption."

The present position of Empire wheat has recently been set forth by Sir James Wilson, K.C.S.I., in the following statement: "Before the War the British Empire was not self-sufficient as regards wheat, the net imports having on the average of five years exceeded the net exports by some 6 million quartern

[1,285,714 tons]; but in each of the last three cereal years its net exports have exceeded its net imports, and last year the three exporting countries of the Empire (Canada, Australia, and India) actually exported 15 million quarters [3,214,285 tons] more than were imported by the importing countries of the Empire (United Kingdom, South Africa, and other overseas possessions). During the current cereal year, thanks mainly to Canada's excellent crop, the surplus available for export in the three exporting countries is likely to be large enough to supply all the importing countries of the Empire with more than double the quantity of wheat they will require to import—the estimated surplus available for export being 69 million quarters [14,785,704 tons], while the whole imports of the importing countries of the Empire are not likely to exceed 33 million quarters [7,071,424 tons]. It seems practically certain that for many years to come the Empire will grow much more wheat than it itself requires, and leaving a large surplus to spare for export to foreign countries " (" The World's Wheat Position," *Empire Production and Export*, January, 1924, p. 19).

Wheat offals are imported to some extent for stock-feeding purposes, the figures being as follows (tons and £):

BRAN AND POLLARD.

	Empire.	*Foreign.*
1913	1,017 (£5,859) ..	12,904 (£65,801)
1921	862 (£7,700) ..	101,735 (£874,522)

SHARPS AND MIDDLINGS.

	Empire.	*Foreign.*
1913	486 (£3,095) ..	15,718 (£88,406)
1921	— ..	38,147 (£395,154)

2. BARLEY.—The brewing industry accounts for the greater part of this crop, and the home-grown supply is quite insufficient for our needs, though it excels in quality, and the English climate is particularly suitable for its production. The amount raised has declined, however, and oats have often taken its place.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre.*		*Imports (Thousands of Tons and £).*	
			Bushels.	*Cwts.*	*Empire.*	*Foreign.*
1913	1,930	1,580	34·0	16·4	310 (£2,152)	811 (£5,924)
1921	1,782	1,299	30·4	14·6	189 (£2,392)	602 (£8,137)

In the cereal year 1921-22 Great Britain imported 37 per cent. of the barley required, only a little over 20 per cent. of the imported grain being of Empire origin.

As regards average yield, expressed in bushels per acre, the United Kingdom with the figure 32·1 occupied the same place (seventh) in 1920 as for wheat, being surpassed by the Netherlands (46·8), Belgium (46·2), Denmark (37·9), Chile (37·1), New Zealand (33·9), and Norway (33·2). The figure for the U.S.A., second in total production, was 23·9, slightly larger than Canada (23·8), while Australia gave 21·4, and India, third in total production, 19·3.

The average price per quarter for home-grown barley (England and Wales) was 27s. 3d. in 1913, 52s. 2d. in 1921, and 40s. 1d. in 1922.

Imported barley generally fetches a lower price than the best varieties produced at home.

Barley-Meal, Pearl Barley, etc.—Imports as follows (thousands of tons and £):

	Empire.	*Foreign.*
1913	— ..	74 (£39)
1921	0·3 (£4) ..	26 (£34)

Malt is dealt with under Potable Alcohol (p. 46).

3. OATS.—The importance of this cereal for stock-feeding, and the fact that it is mainly grown for local consumption in this way, gives it a stronger position in home agriculture.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre.*		*Imports (Thousands of Tons and £).*	
			Bushels.	*Cwts.*	*Empire.*	*Foreign.*
1913	3,961	2,930	41·7	14·8	123 (£795)	785 (£4,877)
1921	4,413	2,945	37·3	13·3	196 (£2,138)	221 (£2,264)

For the cereal year 1921-22 Great Britain imported 16 per cent. of her total requirements as regards oats, about 35·6 per cent. of the imported grain being of Empire origin (Canadian).

Average price per quarter of home-grown oats (England and Wales): 1913, 19s. 1d.; 1921, 34s. 2d.; 1922, 29s. 1d.

There is a good deal of variation in the price relation between home-grown and imported oats, the latter having the advantage when competing with English new-crop supplies.

In 1920 the United Kingdom, sixth in total production, had an average yield of 39·1 bushels per acre, being only surpassed by Belgium (46·2) and the Netherlands (44·9). The U.S.A., easily first in total yield, gave 28·2, rather less than Canada (28·5), and a good deal less than New Zealand (34·5). The figure for Australia was 19·8, and that for South Africa 11·0.

Oatmeal, Rolled Oats, etc.—Imports were as follows (thousands of tons and £):

	Empire.	*Foreign.*
1913	20 (£298) ..	24 (£309)
1921	25 (£716) ..	17 (£492)

4. RYE.—This is of minor importance as a grain crop.

	Acreage (Thousands).	Total Yield. (Tons).	Imports (Thousands of Tons and £).	
			Empire.	Foreign.
1913	51·04	—	9 (£55)	37 (£235)
1921	84·60	—	19 (£378)	24 (£442)

5. MAIZE.—Our imports have been as follows (thousands of tons and £):

		Empire.		Foreign.	
		Grain.	Maize-Meal, Corn-flour, etc.	Grain.	Maize-Meal, Corn-flour, etc.
1913	tons	29	0·3	2,428	24
	£	175	3	13,594	180
1921	tons	511	94	1,327	33
	£	4,907	985	13,539	441

6. RICE.—This is much less important than maize to this country, as the import figures show (thousands of tons and £):

		Empire.		Foreign.	
		Grain.	Rice Flour.	Grain.	Rice Flour.
1913	tons	127	0·06	88	7
	£	1,284	0·5	986	84
1921	tons	189	0·348	153	0·588
	£	3,486	6·18	2,913	14·75

II.—ROOT CROPS.

1. TURNIPS AND SWEDES.

	Acreage (Thousands).	Total Yield (Thousands of Tons).	Yield per Acre (Tons).
1913	1,758	25,314	14·4
1921	1,570	17,622	11·2

2. MANGELS.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre (Tons).*
1913	500	9,276	18·5
1921	453	7,796	17·2

3. POTATOES.—Our home-grown supplies are supplemented very considerably by imports.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre (Tons).*	*Imports (Thousands of Tons and £).*	
				Empire.	*Foreign.*
1913	1,173	7,605	6·5	55 (£623)	416 (£1,966)
1921	1,288	6,534	5·1	56 (£1,431)	97 (£1,653)

4. FIELD CABBAGES, KOHL RABI, AND RAPE.—The acreage (thousands) was 189 in 1913, and 170 (Great Britain) in 1921.

5. CASSAVA, TAPIOCA, ETC.—Imports as follows:

		Empire.	*Foreign.*
1913	Tons (thousands)	10	37
	£ „	147	352
1921	Tons (thousands)	10	30
	£ „	222	471

6. ARROWROOT.—The following amounts were imported:

		Empire.	*Foreign.*
1913	Tons (thousands)	2	—
	£ „	65	—
1921	Tons (thousands)	0·5	0·007
	£ „	27	0·7

III.—PULSE CROPS.

1. PEAS.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre.*		*Imports (Thousands of Tons and £).*	
			Bushels.	*Cwts.*	*Empire.*	*Foreign.*
1913	128	94	26·4	14·7	58 (£468)	41 (£539)
1918	128	98	27·5	15·3	11 (£293) (1921)	55 (£1,353)

2. BEANS.

	Acreage (Thousands).	Total Yield (Thousands of Tons).	Yield per Acre.		Imports (Thousands of Tons and £).	
			Bushels.	Cwts.	Empire.	Foreign.
1913	266	217	28·6	16·4	7 (£67)	86 (£740)
1918	251	214	29·7	17·0	45 (£507) (1921)	—

3. LENTILS.—Imports as follows:

		Empire.	Foreign.
1913	Tons	7,512·5	3,688·5
	£	53,478	23,448
1921	Tons	8,814·9*	3,034·4
	£	167,562*	87,173

* Egypt included.

IV.—GRASS CROPS.

There is a considerable area of natural grass land (rough grazing), of most importance in upland districts devoted to sheep-farming. The figures given (thousands of acres) refer to artificially sown grasses, those for 1921 being for Great Britain only (Irish figures not available):

1. PERMANENT GRASS.—1913, 27,280; 1921, 15,906.
2. CLOVER AND ROTATION GRASSES.—1913, 6,600; 1921, 4,026.
3. HAY (All Kinds).—United Kingdom:

	Acres.	Total Yield (Thousands of Tons).
1913	9,824	15,395
1921	8,733	9,383

Hay, although compressible by hydraulic means to a considerable extent, is too bulky a commodity to occupy more than a minor position in imports and exports.

Imports as follows (tons and £):

	Empire.	Foreign.
1913	37,967 (£161,307)	24,562 (£109,070)
1921	390 (£2,654)	964 (£6,638)

V.—FORAGE CROPS.

The published statistics divide these into two categories, vetches and other green forage crops. Field cabbages, kohl rabi, and rape have been given under Root Crops, and rotation grasses, etc., under Grass Crops. The figures include the Isle of Man and the Channel Islands.

1. VETCHES OR TARES.—The acreage (thousands) in 1913 was 115, and 133 (not including Irish vetches.)

2.—OTHER GREEN FORAGE CROPS.—The acreage (thousands) was 225, and 262 in 1920 (including Irish vetches).

VI.—SUGAR CROPS.

1. SUGAR BEET.—Considerable areas in the British Isles are well adapted for growing this crop, and a promising beginning has been made. Our sugar requirements are enormous, as shown by import figures, and it is highly desirable, from strategic considerations, to increase home production to the utmost extent possible. The valuable residues must be taken into consideration.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre (Tons).*
1913 ..	4·08	—	—
1923 ..	16·90	—	—
Cantley ..	11·5	55·14	5·8

For 1921 and 1922 the acreages (thousands) were 8·33 and 8·40, the increases being in the Lincoln areas. The corresponding yields of washed and topped roots (thousands of tons) were 65·4 and 55·1.

In 1923 the Cantley factory produced 7,011 tons of white sugar and 4,580 tons of dried pulp.

Successful development of the sugar beet industry in this country would help in the maintenance of an adequate arable cultivation, employ much labour, yield reasonable profits, and reduce our present dependence on imports of an essential food-stuff. Particulars can be obtained from the Secretary of the British Sugar Beet Growers' Society, Ltd., 6, Lancaster Place, Wellington Street, Strand, W.C. 2. Strand, W.C. 2.

2. SUGAR (CANE AND BEET).—Imports as follows (thousands of tons and £):

	Empire.	*Foreign.*
1913	72·02 (£930·9)	1,897·24 (£22,135·6)
1921	384·43 (£10,918·9)	898·56 (£24,419·8)

3. MOLASSES AND INVERT SUGAR.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	6·80 (£31·79)	156·26 (£625·81)
1921	0·40 (£ 7·87)	94·21 (£621·26)

4. GLUCOSE.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	43 cwts. (£80) ..	73 (£739)
1921	0·5 cwt. (£16) ..	57 (£1,031)

5. SWEETENED STOCK-FOOD.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	7·5 (£30·8)	16·3 (£68·0)
1922	1·9 (£15·9)	1·2 (£11·1)

6. CONFECTIONERY.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	0·77 (£55·9)	3·23 (£222·9)
1922	0·57 (£ 7·8)	1·24 (£194·9)

VII.—FRUIT.

Statistics of production are not available. The most recent figures for acreages are as follows:

	England and Wales.	*Scotland.*	*Ireland.*
Orchards ..	231,900 (1923)	1,536 (1922)	21,300 (1922)
Small fruits ..	63,700 (1923)	6,758 (1922)	

Much has been done of late years in all branches of horticulture, and important researches have been carried out at several centres, of which the most important are the Agricultural and Horticultural Research Station (Long Ashton, Bristol) and the Wye Agricultural College.

Overseas competition is particularly keen, and the following table of imports indicates the general direction of trade.

1. FRESH FRUIT.—Imports as follows (thousands of tons and £):

		1913.		1921.	
		Empire.	*Foreign.*	*Empire.*	*Foreign.*
Apples	Tons	78	85	95	105
	£	1,040	1,190	3,542	3,851
Pears	Tons	3	32	3	34
	£	86	564	253	1,411
Plums, apricots, and peaches	Tons	0·22	207	0·3	10
	£	29	438	48	769
Bananas	Bunches	500	7,040	1,385	8,117
	£	183	2,040	668	5,985
Oranges	Tons	4	285	24	268
	£	74	2,403	841	7,112
Lemons, Limes, etc. ..	Tons	0·07	34	41	41
	£	1	476	1,030	1,042
Other fresh	Tons	2	55	3	65
	£	177	1,191	351	3,234

2. DRIED FRUIT.—Imports (thousands of tons and £):

		1913.		1921.	
		Empire.	*Foreign.*	*Empire.*	*Foreign.*
Currants	Tons	0·08	65	2	48
	£	2	1,638	155	3,063
Raisins	Tons	0·47	4	8	28
	£	14	1,223	725	2,946
Dates	Tons	0·4	27	16	5
	£	6	384	572	377
Plums and prunes	Tons	0·17	10	0·17	20
	£	7	377	18	1,480
Figs	Tons	11 cwts.	8	8 cwts.	9
	£	24	226	40	562
Other dried	Tons	0·22	1·5	1·28	3
	£	6	55	107	261

3. PRESERVED FRUIT.—Imports (thousands of tons and £):

		1913.		1921.	
		Empire.	*Foreign.*	*Empire.*	*Foreign.*
Pineapples	Tons	12	1	14	6
	£	285	38	880	390
Canned or bottled ..	Tons	3	8	4	10
	£	50	154	239	416
Other preserved (and peel)	Tons	2·5	15·6	23·7	15·9
	£	4·1	309·8	89·7	877·0

4. FRUIT JUICE AND SYRUP.—Imports (thousands of gallons and £):

		1913.		1921.	
		Empire.	*Foreign.*	*Empire.*	*Foreign.*
Lime and Lemon	Gallons	610	140	409	91
	£	80	14	90	12
Other kinds	Gallons	1	142	189·4	238·6
	£	0·16	15·7	45·5	82·2

5. JAMS AND JELLIES.—Imports (thousands of tons and £):

		1913.		1921.	
		Empire.	*Foreign.*	*Empire.*	*Foreign.*
Jams and jellies	Tons	0·04	0·03	2·50	0·18
	£	1·9	1·8	168·28	12·82

VIII.—Edible Nuts.

Imports as follows (thousands of tons and £):

	1913.		1922.	
	Almonds.	*Other Nuts.*	*Almonds.*	*Other Nuts.*
Empire: ..	0·01 (£0·75)	9·05 (£118·4)	0·016 (£2·10)	26·56 (£1,033·01)
Foreign: ..	7·88 (£887·4)	26·47 (£775·5)	10·18 (£1,411·9)	38·43 (£2,069·25)

IX.—Vegetables.

As in the case of fruit, few statistics are available, except for onions and the figures as to imports. Local requirements are for the most part satisfied by home-grown produce.

1. Onions:

	Acreage (Thousands) (England and Wales).	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913 ..	3·96	—	—
1923 ..	2·35	—	—

Imports (thousands of bushels and £):

	Empire.	*Foreign.*
1913	31·38 (£3·44)	9,073·78 (£1,031·61)
1921	1,684·43 (£569·39)	7,227·31 (£2,383·26)

2. Tomatoes.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	20,436·3 (£471·83)	58,713·0 (£876·85)
1921	39,883·5 (£2,254·28)	74,159·0 (£2,895·37)

3. Dried Vegetables.—Imports (tons and £):

	Empire.	*Foreign.*
1913	113 (£99)	5,503 (£11,725)
1921	110 (£397)	2,760 (£9,726)

4. Canned and Bottled Vegetables.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	0·50 (£9·12)	23,939·4 (£492·1)
1921	0·29 (£12·92)	22,751·3 (£848·6)

X.—Miscellaneous.

1. Buckwheat.—Imports (tons and £):

	Empire.	*Foreign.*
1913	168·7 (£1,251)	3,315·5 (£28,470)
1921	58·5 (£929)	1,160·5 (£17,510)

2. Sago.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	22·94 (£223·4)	1·45 (£10·7)
1921	16·18 (£278·1)	0·71 (£11·3)

3. Various Meals and Flours.—Imports (tons and £):

	Empire.	*Foreign.*
1913	18 (£216)	7,443 (£58,356)
1921	2 cwts. (£5)	2,424 (£14,031)

4. Farinaceous Food.—Imports (tons and £):

	Empire.	*Foreign.*
1913	634·9 (£25,998)	19,037·5 (£241,823)
1921	1,269·6 (£82,236)	2,180·3 (£149,513)

5. Yeast.—Imports (tons and £):

	Empire.	*Foreign.*
1913	7·85 (£428)	10,474·4 (£411,555)
1921	— (£—)	5,104·3 (£356,096)

6. Edible Oils.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	0·45 (£20·3)	52·54 (£2,381·5)
1921	10·88 (£653·2)	32·40 (£2,224·9)

7. Oilcakes.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	79·11 (£518·9)	327·59 (£2,020·9)
1921	155·66 (£1,621·5)	169·95 (£1,984·7)

8. Locust Beans.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	20·49 (£107·9)	10·67 (£56·6)
1921	43·34 (£295·5)	1·38 (£10·6)

9. Various Feeding-Stuffs for Animals.—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	167·55 (£862·4)	130·33 (£760·7)
1921	122·43 (£925·9)	42·60 (£445·6)

XI.—Potable Alcohol (and Vinegar).

1. Spirits.—In the year 1920-21 there were 163 distilleries in the United Kingdom. The output (in gallons) was 51,802,468 for 1913-14, and 36,597,788 for 1921-22. Spirits retained for consumption in the calendar years 1914 and 1922 as follows:

	Home Produce.	*Imported.*	*Total.*
1914	26,794,739	5,801,687	32,596,426
1922	14,546,394	3,114,729	17,661,123

The following table gives the imports of the chief spirituous liquors (in thousands of gallons and £) for 1913 and 1921:

		1913.	1921.
Brandy ..	Gallons	1,490·02	393·27
	£	802·85	860·32
Gin	Gallons	424·58	87·58
	£	64·61	53·70
Rum	Gallons	4,699·60	4,402·18
	£	354·50	999·26
Other spirits..	Gallons	508·72	389·26
	£	301·30	526·77
Liqueurs ..	£	97·00	44·47

2. Malt Liquors.—The quantities of the chief raw materials used in brewing are given for 1914 and 1921 in the following table:

	Malt (Bushels).	*Unmalted Corn (Bushels).*	*Rice, Maize, etc. (Cwts.).*	*Sugar and Equivalents (Cwts.).*	*Hops (Lbs).*	*Hop Preparations (Lbs.).*	*Hop Substitutes (Lbs.).*
1914 ..	52,525,634	92,385	1,566,506	3,279,710	62,655,438	*	19,503
1921 ..	39,268,888	68,001	979,956	1,873,524	50,876,885	7,635	9,872

(*a*) *Malt.*—Imports (thousands of tons and £):

	Empire.	*Foreign.*
1913	—	2·26 (£31·02)
1921	—	8·22 (£323·79)

* Included in Hops.

(*b*) *Hops :*

	Acreage (Thousands).	*Total Yield (Tons).*	*Yield per Acre (Cwts.).*	*Imports (Tons and £).*	
				Empire.	*Foreign.*
1913	36	12,782	7·17	807 (£103,344)	12,302 (£1,649,659)
1921	25	11,200	8·9	987 (£411,185)	10,020 (£3,398,105)

(*c*) *Ale, Beer, and Stout.*—The bulk production of home-brewed beer for sale (in barrels of 36 gallons) for 1914 was 37,558,767 (average specific gravity 1052·80), and 30,178,731 (average specific gravity 1042·88) in 1922.

Imports (thousands of 36-gallon barrels and £):

	Empire.	*Foreign.*
1913	0·23 (£0·65)	75·56 (£219·43)
1921	0·19 (£1·29)	3·87 (£22·44)

3. CIDER AND PERRY.—No reliable figures exist as to home production. For cider this is estimated at somewhere between 50 and 100 million gallons, of which the larger part is made on farms.

Imports (gallons and £):

	Empire.	*Foreign.*
1913	128,720 (£4,089)	33,430 (£1,754)
1921	6,523 (£878)	12,846 (£1,435)

4. WINE.—Imports (thousands of gallons and £):

	Empire.	*Foreign.*
1913	972 (£147)	11,361 (£3,931)
1921	669 (£240)	8,864 (£5,078)

5. VINEGAR.—Imports (gallons and £):

	Empire.	*Foreign.*
1913	— —	231,125 (£17,142)
1921	170 (£9)	338,045 (£67,329)

CHANNEL ISLANDS

Area 70 square miles. Population (1921) 89,614. They are of considerable importance to the United Kingdom as a source of vegetables and fruit. The productive acreage in 1921 was: arable, 21,000; pasture, 10,000; rough grazing, 2,000.

ISLE OF MAN

Area 230 square miles. Population (1921) 60,238. The productive acreage in 1921 was as follows: arable, 66,000; pasture, 18,000; rough grazing, 35,000.

CULTIVATION STATISTICS.

	Isle of Man. 140,986		*Jersey.* 28,717		*Guernsey, etc.* 15,750	
Total acreage	1913.	1922.	1913.	1922.	1913.	1922.
Crops and grass	91,225	83,645	19,666	19,412	11,565	11,137
Arable	71,706	65,600	15,922	15,941	5,321	4,714
Permanent grass: Hay ..	2,695	2,434	1,220	982	3,122	3,118
Not hay	16,824	15,521	2,524	2,489	3,122	3,305
Rough grazing	—	35,776	—	1,152	—	882
Wheat	294	229	698	426	201	199
Barley	1,997	534	134	55	138	93
Oats	20,027	19,472	1,344	1,226	648	739
Mixed corn	—	23	—	4	—	11
Rye	30	11	88	105	19	29
Beans	64	51	8	5	43	26
Peas	117	46	15	11	21	14
Potatoes	2,529	2,208	8,271	8,923	639	830
Turnips, etc.	7,789	6,526	95	141	65	51
Mangel	192	329	275	310	357	349
Cabbages, Kohl rabi, and rape	585	1,071	23	9	27	6
Vetches	44	106	18	14	249	220
Lucerne	—	8	74	54	217	187
Small fruit	110	63	116	52	142	108
Clover, etc.: Hay ..	10,252	9,843	2,758	2,259	742	351
Not hay	27,437	24,813	1,582	1,346	394	307
Carrots	58	61	36	22	141	131
Onions	2	1	2	3	10	2
Buckwheat	—	—	4	—	1	—
Various vegetables ..	—	57	—	44	—	37

GIBRALTAR

Area 2 square miles. Population 20,000. None of the land is cultivable, and the food supplies are mainly imported, but there are no official statistics.

MALTA AND GOZO

Area 120 square miles. Population 211,000. The colony is in a high state of cultivation, and cereals, forage crops, fruit, and vegetables are largely produced for local consumption, but the food supply is augmented by imports.

Chief Crops.

	1913.			1921.		
	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Acreage.*	*Total Yield (Tons).*	*Yield per Acre (Tons).*
Wheat ..	8,773	6,125	0·69	11,621	1,334	0·11
Barley ..	5,121	3,675	0·72	4,019	2,792	0·69
Potatoes ..	4,488	19,356	4·32	2,350	11,068	4·71

Chief Imports.

		1913–14.	1921.
Wheat	Tons	23,164	17,528
	£	218,256	353,613
Beans	Tons	5,377	—
	£	58,223	98,298
Flour and semola	Tons	10,586	17,898
	£	116,780	471,607
Sugar	Tons	4,681	4,395
	£	62,583	197,657
Ale and beer	Gallons	1,005,983	519,335
	£	42,858	58,519
Spirits	Barrels	13,625	52,158 gallons
	£	24,920	42,555
Wines	£	83,533	155,570

Chief Exports (Domestic Produce).

		1913–14.	1921.
Potatoes	Tons	16,146	8,260
	£	98,593	90,287
Onions	Tons	—	938
	£	—	5,343
Oranges	Dozen	—	16,844
	£	—	941

ASIA

CYPRUS

Area, 3,584 square miles. Population (1921), 310,709. In spite of a somewhat deficient water supply, the soil is particularly fertile; cereals and fruits are grown on a considerable scale, and the wine industry is of importance.

CHIEF CROPS.

	1913.			1921.		
	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Acreage.*	*Total Yield (Tons).*	*Yield per Acre (Tons).*
Wheat ..	—	73,129	—	197,664	63,752	0·32
Barley ..	—	48,408	—	118,549	46,877	0·39
Oats ..	—	6,895	—	16,515	3,885	0·23
Potatoes ..	—	—	—	2,949	16,869	6·00
Vines ..	46,634	—	—	47,570	—	—
Grapes ..	—	39,629 (1912)	—	—	15,955	0·34
Wine ..	—	—	—	—	1,933,580 gals.	40 gals.
Olives ..	—	11,881	—	—	1,920	—

CHIEF IMPORTS.

		1913.	1921.
Wheat	Tons	6	85
	£	51	1,378
Rice	Tons	910	1,127
	£	10,028	24,274
Flour and meal (wheat) ..	Tons	2,757	2,953
	£	33,887	81,572
Sugar	Tons	1,744	1,901
	£	25,608	69,251
Olive oil	Tons	48	6
	£	2,052	338

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Wheat	Tons	2,358	673
	£	17,661	10,363
Barley	Tons	8,002	154
	£	37,747	8,162
Raisins	Tons	3,973	1,770
	£	39,002	42,517
Other fruit	£	31,510	—
Carobs	Tons	2,249	74,911
	£	179,027	305,479
Vegetables	£	9,889	69,987
Wine	Gallons	1,129,949	1,098,575
	£	43,060	82,229

ADEN AND PERIM

Area, 80 square miles. Population (1921), 56,500. Food production is very limited, and the European population are largely dependent on imports.

CHIEF IMPORTS.

		1913–14.	1921–22.
Wheat flour	Tons	8,223	6,148
	£	91,834	130,377
Rice	Tons	10,062	9,275
	£	98,340	181,226
Jowar and bajra	Tons	15,151	4,137
	£	88,626	43,044
Sugar	Tons	6,130	6,983
	£	82,447	206,914
Fruit and vegetables, preserved	£	68,580	74,946

CHIEF EXPORTS.

		1913–14.	1921–22.
Wheat flour	Tons	4,054	1,684
	£	43,710	35,886
Rice	Tons	9,813	6,933
	£	97,162	127,293
Jowar and bajra	Tons	12,932	3,088
	£	73,829	34,168
Sugar	Tons	4,545	3,969
	£	63,747	121,430
Fruit and vegetables, preserved	£	35,727	55,889

THE INDIAN EMPIRE

The area of the Indian Empire is 1,802,657 square miles, with a population (1921) of 318,942,480—about three-quarters that of the entire British Empire. British India occupies about 61 per cent of this area, and is inhabited by nearly 78 per cent. of the total population, while the Native States extend over the rest of the area and their population is a little over 22 per cent. of the total (about 70 millions). As a result of the great variety of physical conditions the population is distributed very unequally, about two-thirds being crowded into one-quarter of the total area. The agricultural and pastoral industries are by far the most important, and directly support over 70 per cent. of the population.

In the Himalayan region such cereal crops as barley and oats flourish, but the Great Plain, from the Indus to the Ganges, is the chief seat of agriculture, and yields a great variety of produce, from cereals and pulses in the north to sugar cane in the south. Rice, millet, and many other crops are cultivated in the valleys and on the higher ground of the Deccan, where irrigation is systematically practised, while Burma is particularly notable for rice-growing.

I.—Grain Crops and Products.

1. Wheat:

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Yield per Acre (Lbs.).*	*Imports (Thousands of Tons and £).*	**Exports (Thousands of Tons and £).*
1913–14 ..	28,475	8,358	658	7·3 (£59)	1,202 (£8,755
1921–22 ..	28,234	9,817	779	439,985 (£9,140,672)	80 (£1,468)

* Exports are chiefly drawn from the crop of the preceding year.

For the five years ending 1912-13 the average area under wheat was 27 million acres, and the annual yield about 8 million tons.

India produces about one-tenth of the world crop, and before the War stood third as regards production (about one-third the U.S.A. yield and nearly twice that of Canada), and fifth with reference to export. In 1920 its production was only exceeded by the U.S.A., and it came sixth in the list of exporting countries Since wheat is not the staple food-grain for local consumption, except in the Panjab, it is mainly grown to supply the demands of other countries, especially the United Kingdom, and the output for this purpose could be increased to a very large extent. But it must be remembered that the standard of living is rising in India, and this is associated with a greater local demand for wheat as food.

Indian wheat is extremely important for the United Kingdom, for it tides over the interval between the harvests of Australia and the Argentine, and those of Europe. Though not of the same fine quality as the best Australian, it is well adapted for milling, and is particularly valuable when English wheat has been harvested during a wet season.

Wheat Flour :

	Imports (Tons).	*Exports (Tons).*
1913–14	4,289·6 (£45,507)	79,412·2 (£834,068)
1921–22	1,957 (£37,824)	64,420 (£1,870,183)

Bran and Pollards.—Imports included in "Fodder" under Miscellaneous (p. 56). Exports: 221,994 tons (£478,780) in 1913-14; 176,366 tons (£1,082,021) in 1921-22.

2. BARLEY:

	Acreage (Thousands).	Total Yield (Thousands of Tons).	Exports (Thousands of Tons and £).
1913–14	7,157	2,685	190 (£1,044)
1921–22	7,300	3,128	10 (£204)

Most of the Indian barley is grown in the United Provinces and Bihar. The greater part of the yield is locally consumed, and what is exported is chiefly taken by the United Kingdom, where shortage of supply corresponds with increased importation from India.

3. OATS.—Oats are chiefly grown in the Punjab and United Provinces. Before the War most of the export went to Mauritius and Ceylon, but some is now taken by Australia.

Imports (tons): 1913-14, 1,273 (£9,980); 1921-22, — (£ —).
Exports (tons): 1913-14, 469 (£3,391); 1921-22, 515 (£10,134).

4. MAIZE:

Cultivation on a large scale is limited to the United Provinces, Bihar and Orissa, the Punjab, Bombay, and the Central Provinces.

	Acreage. (Thousands).	Total Yield (Thousands of Tons).	Exports (Tons).
1913–14	6,148	2,084	2,880 (£13,969)
1921–22	6,186	2,406	1,744 (£15,708)

5. RICE:

	Acreage (Thousands).	Total Yield (Thousands of Tons).	Yield per Acre Cleaned Rice (Pounds).	Imports (Tons).	Exports (Thousands of Tons and £).
1913–14 ..	76,908	30,138	849	11,388·7 (£119,291)	2,450 (£17,738)
1921–22 ..	81,256	33,038	911	351 (£8,385)	1,405 (£24,917

It has been estimated (*Bull. Imperial Institute*, xv., 1917, p. 254) that the world production of rice is approximately 90 million tons (including a supposed yield of 30 million for China), of which 40 per cent. is grown in India, the largest exporting country, in spite of the fact that her shipments rarely exceed 7 per cent. of the total yield. The greater part of the Indian rice exported comes from Burma, where failure of rains is unknown, so that the yield is steadily maintained. About half of the exported Indian rice is consumed as food, and the remainder is partly used as food and partly employed for distillation and starch production.

III.—Pulse Crops.

Peas and Beans:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Chiefly N.Z.)*	*Exports (Tons). (Nearly all Empire.)*
1913–14 ..	38,839	17,357·4 (£144,296)	16·68	1,345·9 (£19,242)	283·8 (£4,202)
1921–22 ..	—	—	—	791·7 (£22,234)	7,683·9 (£137,800)

IV.—Grass Crops.

1. Artificially Sown Grasses.—These are mostly sown on uncultivated land after burning off the existing vegetation. The acreages of permanent grass were as follows: 1913-14, 3,208,362; 1919-20, 3,758,120.

2. Hay.—After wheat this is the most important Commonwealth crop, and occupied in 1920-21, 21·45 per cent. of the cultivated area. Its expansion is related to the increasing development of the meat trade and the dairy industry.

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Imports. Hay and Chaff (Tons).*	*Exports. Hay and Chaff (Tons).*
1913–14 ..	2,754,672	3,372,596	1·22	67·9 (£291)	13,021·5 (£53,657)
1921–22 ..	—	—	—	66 (£533)	3,491 (£21,354)

It should be noted that while in European countries the hay crop mostly consists of grasses and the associated clovers, etc., a very large proportion of Australian hay consists of cereals, particularly wheat and oats, while a large quantity of lucerne (alfalfa) hay is also made.

The Commonwealth hay crop for the season 1915-16 was the highest on record, and amounted to 5,633,988 tons. The second in importance was 4,686,366 tons for the season 1920-21, while the third was 3,955,311 tons for 1912-13.

Considering the bulky nature of the commodity any very large increase in the export trade can hardly be anticipated.

3. Seed Grass, Clover, etc.:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*
1913–14	3,669	340·0 (£14,285)	9·87
1919–20	6,765	583·4 (£34,896)	8·84

4. Ensilage.—Dairy farmers and sheep-breeders are beginning to realize the importance of this feeding-stuff, and the Government of Victoria not only provides instruction, but also erects silos on liberal terms, repayment extending over a series of years. The Government of N.S.W. also provides instruction, gives advice, and arranges for demonstrations on experimental farms, but does not extend financial aid.

In 1920-21 the output was 35,431 tons, valued at £62,820.

V.—Forage Crops.

Mostly cereals and lucerne, chiefly grown in connection with the dairying industry.

	Acreage Harvested.	*Total Value.*	*Value per Acre.*
1913–14	486,504	£1,594,834	£3 5s. 7d.
1919–20	1,401,237	£2,627,051	£1 17s. 6d.

VI.—Sugar Crops.

1. Sugar Beet and Beet Sugar.—Efforts are being made to revive the sugar beet industry in Victoria, and an irrigation scheme is in progress by which large areas will be made suitable for cultivation. A fine grade of white sugar is manufactured, and the residues are distributed for stock-feeding.

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1919–20	1,090	13,195	12·11

2. Sugar Cane.—For sugar-making purposes this is only grown in Queensland and N.S.W., more extensively in the former State, though the average yield per acre is much higher in the latter.

	Acreage.		*Total Yield (Tons).*	*Yield per Acre (Tons).*
	Productive.	*Unproductive.*		
1913–14 ..	94,661	79,340	2,271,558 (£2,575,386)	20·84 (£16 0s. 9d.)
1919–20 ..	89,704	69,333	1,350,081 (£2,505,932)	15·05 (£15 15s. 2d.)

Cane Sugar :

	Production (Tons).	*Imports (Tons). (Mostly Fiji.)*	*Exports (Tons). (Mostly Pacific.)*
1913–14 ..	173,296 (1911)	1,497,230 (£864,768)	3,419 (£54,322)
1921–22 ..	167,401 (1920)	6,888 (£174,850)	1,918 (£60,145)

Although at present Australia imports on a large scale, there is no reason why she should not ultimately occupy a prominent place among sugar-exporting countries. It should also be noted that a considerable part of her requirements are supplied by another part of the Empire—Fiji.

Molasses.—6,451,192 gallons were produced in 1911 in the Australian sugar mills, and 6,175,867 in 1922. Part of this product is used for distillation, part is prepared for human consumption, part is converted into stock-food, and a certain proportion is employed as manure, while a not inconsiderable quantity is allowed to run to waste.

Glucose :

	Imports (Tons). (Foreign.)	*Exports (Tons). (Empire.)*
1913–14	4,090·5 (£51,958)	15·7 (£240)
1921–22	449·7 (£8,258)	7·0 (£240)

Invert Sugar, etc.—Imports: 1913-14, 11·7 tons (£189); 1921-22, 11·8 tons (£413).

Golden Syrup, etc.:

	Imports (Tons).	*Exports (Tons). (Empire.)*
1913–14	40·4 (£1,038)	18·0 (£305)
1921–22	2·5 (£143)	8·0 (£290)

Other Cane Sugar Products:

	Imports (Tons).	*Exports (Tons).*
1913–14	39·7 (£774)	—
1921–22	11·9 (£325)	2·0 (£97)

VII.—Fruit.

A complete treatise would be required to give an adequate idea of this important and growing industry, which is capable of indefinite extension. Some notion of the relative position occupied by different kinds of fruit (not including grapes) may be gathered from the following table, giving acreages, total yields, and total crop values for 1920-21. Imports and exports for 1913-14 and 1921-22 are then stated in summary form, as in the official Commonwealth statistics.

	Acreage.	*Bushels.*	*Value.*
Apples	79,917	5,870,471	£1,750,531
Pears	15,957	1,450,219	356,569
Plums	10,701	773,836	207,467
Nectarines and peaches ..	25,155	1,921,844	702,891
Apricots	10,232	690,827	278,637
Oranges	30,881	2,582,867	1,045,642
Lemons	4,918	464,572	160,354
Bananas	12,908	1,403,347	649,996
Pineapples	3,934	832,033 doz.	291,393
Other fruits	19,935	—	563,981
Total	214,538		6,007,461

1. Fresh Fruit:

Apples:	*Imports (Tons). (Mostly U.S.A.)*	*Exports (Tons). (Mostly to U.K.)*
1913–14	2,692·4 (£68,146)	22,014·2 (£325,600)
1921–22	—	37,433·4 (£803,286)

Citrus fruit:	*(Mostly Foreign.)*	*(Mostly N.Z.)*
1913–14	Included in Other Fresh Fruits	1,295·2 (£22,865)
1921–22	223·4 (£8,895)	2,655·4 (£79,754)

1. FRESH FRUIT—*Continued :*

Bananas:	*(Mostly Fiji.)*	
1913–14	16,407·6 (£241,137)	—
1921–22	830·8 (£20,797)	222·6 (£6,457)
Pineapples:	*(Mostly Foreign.)*	*(Nearly all N.Z.)*
1913–14	0·6 (£14)	293·0 (£3,980)
1921–22	0·6 (£13)	287·5 (£6,199)
Other fresh fruit:		*(Mostly U.K.)*
1913–14	113·3 (£2,560)	2,483·3 (£47,355)
1921–22	10·1 (£202)	2,857·4 (£78,030)

2. DRIED FRUITS :

	Imports (Tons).	*Exports (Tons).*
Currants:	*(Mostly Foreign.)*	*(Mostly Empire.)*
1913–14	36·4 (£1,033)	210·8 (£5,122)
1921–22	1·59 (£102)	4,884·4 (£344,238)
Raisins:	*(Foreign.)*	*(Mostly Empire.)*
1913–14	84·6 (£4,837)	856·4 (£25,365)
1921–22	97·9 (£12,021)	589·5 (£550,838)
Dates:	*(Nearly all Foreign.)*	*(Mostly Empire.)*
1913–14	1,019·2 (£61,048)	17·5 (£396)
1921–22	2,183·8 (£83,640)	85·6 (£2,060)
Other dried fruits:	*(Mostly Foreign.)*	*(U.K. Best Customer.)*
1913–14	1,019·2 (£45,521)	21·8 (£1,216)
1921–22	410·5 (£36,549)	721·6 (£72,321)

3. JAMS AND JELLIES.

	Imports (Tons).	*Exports (Tons).*
	(Mostly U.K.)	*(Mostly Empire.)*
1913–14	202·2 (£12,213)	829·6 (£29,402)
1921–22	29 7 (£3,765)	2,518·1 (£164,046)

4. PEEL:

	Imports (Tons).	*Exports (Tons).*
	(Largely British.)	
1913–14	473·1 (£6,202)	17·9 (£211)
1921–22	29·0 (£1,883)	37·9 (£2,162)

5. FRUIT JUICES AND SYRUPS (non-alcoholic, and including unfermented wine).

	Imports (Gallons.)	*Exports (Gallons).*
	(Nearly all Empire.)	*(Largely Foreign.)*
1913–14	59,639 (£10,921)	15,729 (£3,745)
1921–22	21,969 (£4,961)	73,683 (£28,082)

6. PRESERVED FRUIT AND VEGETABLES (other than dried):

	1913–14.	1921–22.
Value of imports (mostly foreign)	£50,740	£47,998
Value of exports (mostly U.K.) (including pulped fruit)	£23,069	£1,024,957

VIII.—EDIBLE NUTS.

1. ALMONDS:

	Imports (Tons). (*Mostly Foreign.*)	*Exports (Tons).* (*Empire.*)
1913–14	206·4 (£31,169)	2·4 (£303)
1921–22	361·4 (£57,916)	27·0 (£294)

2. OTHER NUTS:

	Imports (Tons).	*Exports (Tons).* (*Mostly N.Z.*)
1913–14	2,352·0 (£72,388)	40·9 (£1,318)
1921–22	4,450·7 (£220,827)	93·4 (£5,603)

IX.—VEGETABLES.

1. MARKET GARDENS:

	Acreage.	*Total Yield.*	*Yield per Acre.*
1913–14	29,940	£985,073	£32 18s. 2d.
1920–21	28,260	—	—

2. ONIONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	6,932	28,455 (£179,389)	4·10 (£25 17s. 7d.)
1920–21	9,061	49,088·0 (£183,946)	5·42 (£20 6s. 2d.)

3. PUMPKINS AND MELONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	13,992	£147,096	£10 10s. 3d.

4. DRIED OR CONCENTRATED VEGETABLES:

	Value (1913–14).	*Value* (1921–22).
Imports (mostly foreign) ..	£8,355	£7,782
Exports (mostly Empire) ..	£427	£343

5. VEGETABLES (unspecified):

	Imports (Tons). (Mostly Foreign.)	Exports (Tons). (Mostly Empire.)
1913–14	160·9 (£1,882)	101·2 (£1,715)
1921–22	80·9 (£1,858)	151·5 (£3,310)

6. SPLIT PEAS:

	Imports (Tons).	Exports (Tons).
1913–14	4·1 (£64)	6·8 (£145)
1921–22	0·2 (£12)	51·8 (£1,561)

7. PRESERVED VEGETABLES (other than dried) included with Preserved Fruits.

X.—MISCELLANEOUS.

1. BISCUITS:

	Imports (Tons). (Mostly Empire.)	Exports (Tons). (Mostly Empire.)
1913–14	216·7 (£17,238)	2,793·0 (£81,798)
1921–22	13·7 (£2,519)	2,289·4 (£173,755)

2. CONFECTIONERY (including caramel, etc., and cocoa butter):

	Imports (Tons).	Exports (Tons). (Mostly Empire.)
1913–14	4,210·3 (£482,911)	210·0 (£128)
1921–22	1,045·2 (£195,595)	485·6 (£79,132)

3. SAGO AND TAPIOCA:

	Imports (Tons). (Greater part Empire.)	Exports (Tons). (Mostly Empire.)
1913–14	4,371·6 (£57,592)	30·6 (£504)
1921–22	4,265·4 (£83,329)	120·9 (£3,104)

4. INFANTS' AND INVALIDS' FOOD.—In 1921-22 the imports were valued at £33,1913, and the exports at £228,790.

5. MALT EXTRACT:

	Imports (Tons).	Exports (Tons). (New Zealand.)
1913–14	32·7 (£1,390)	13·5 (£1,512)
1921–22	16·3 (£1,482)	13·8 (£1,759)

6. OLIVE OIL:

	Imports (Gallons). (Mostly Foreign.)	Exports (Gallons). (Mostly N.Z.)
1913–14	59,221 (£19,304)	1,859 (£751)
1921–22	33,826 (£17,901)	3,327 (£2,754)

7. OILCAKE:

	Imports (*Tons*).	*Exports* (*Tons*). (*Mostly U.K.*)
1913–14	31·0 (£273)	144·1 (£2,233)
1921–22	14·6 (£209)	6,849·6 (£78,179)

8. AERATED AND MINERAL WATERS:

	Value (1913–14).	*Value* (1921–22).
Imports	£14,214	£715
Exports (mostly Empire)	£2,072	£7,992

9. VINEGAR:

	Imports (*Gallons*). (*Mostly U.K.*)	*Exports* (*Gallons*). (*Mostly Empire.*)
1921–22	62,230 (£19,108)	8,008 (£1,107)

XI.—POTABLE ALCOHOL.

1. SPIRITS.

Distilleries.—In 1920-21 there were 37 distilleries, of which the output (in gallons) was: brandy, 237,746; gin, 52,804; whisky, 202,090; rum, 61,152; other spirits (including Queensland rum), 1,946,178.

	Imports (*Gallons*). (*Mostly Foreign.*)	*Exports* (*Gallons*). (*Mostly Empire.*)
Brandy:		
1913–14	325,657 (£192,246)	3,506 (£2,286)
1921–22	87,771 (£105,656)	2,850 (£4,569
	(*Nearly all U.K. and Canada.*)	(*Mostly Empire.*)
Whisky:		
1913–14	2,251,914 (£771,415)	31,240 (£16,332)
1921–22	861,941 (£1,141,397)	60,177 (£89,231)
	(*Mostly U.K.*)	(*Mostly Empire.*)
Gin:		
1913–14	606,079 (£167,495)	3,849 (£1,192)
1921–22	142,303 (£84,312)	2,617 (£2,972)
	(*Mostly Empire.*)	(*Mostly Empire.*)
Rum:		
1913–14	324,573 (£61,990)	2,657 (£409)
1921–22	21,595 (£16,196)	5,040 (£1,726)
		(*Mostly Empire.*)
Unspecified spirit:		
1913–14	62,772 (£32,876)	187,917 (£14,225)
1921–22	35,139 (£33,944)	1,736 (£2,847)

2. ALE AND STOUT.

Breweries.—In 1920-21 there were 67 breweries, of which the output (in gallons) was 70,235,740, valued at £6,927,782.

Malt:	*Production (Bushels and £).*	*Imports (Tons).*	*Exports (Tons). (Mostly S. Africa and N.Z.)*
1913–14 ..	2,798,414, value	1,517·9 (£31,071)	2·1 (£55)
1921–22 ..	£1,176,903 in 1919–20	0·7 (£43)	134·8 (£3,238)

Hops:	*Acreage.*	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Imports (Tons).*	*Exports (Tons).*
1913–14	1,473	744·5 (£90,509)	0·5 (£61 8s. 11d.)	674·3 (£92,602)	3·2 (£452)
1921–22	—	—	—	33·6 (£77,646)	4·1 (£822)

Ale and stout:	*Imports (Gallons). (Mostly U.K.)*	*Exports (Gallons). (Mostly Empire.)*
1913–14	3,481,960 (£547,238)	39,837 (£6,484)
1921–22	321,090 (£146,143)	237,095 (£77,691)

3. CIDER AND PERRY:

	Imports (Gallons).	*Exports (Gallons).*
1913–14	3,133 (£628)	342 (£85)
1921–22	130 (£123)	982 (£352)

4. WINE:

Vineyards:	*Total Acreage.* *Productive.*	*Unproductive.*	*Productive Acreage for Wine.*	*Yield Wine Grapes (Tons).*
1913–14	50,765	10,432	—	33,707 (£460,692)
1920–21	63,418	17,747	35,208	—

Wine:	*Wine Made (Gallons).*	*Imports (Gallons). (Mostly Foreign.)*	*Exports (Gallons). (Mostly Empire.)*
1913–14	4,709,891	144,740 (£171,876)	702,322 (£105,809)
1921–22	7,649,404 (1919–20)	40,605 (£31,474)	604,558 (£160,357)

Miscellaneous wine (non-grape):	*Imports (Gallons).*	*Exports (Gallons).*
1913–14	5,173 (£1,484)	318 (£221)
1921–22	2,118 (£2,035)	472 (£581)

PAPUA

This Australian Dependency, the southern part of East New Guinea, has an area of 90,540 square miles. The white population in 1921 was 1,264, and the coloured non-Papuan population 577. The estimated number of natives was 250,000.

The climate is favourable to agriculture, and the rainfall is abundant and evenly distributed, and almost every kind of tropical product can be successfully cultivated. The chief plantation industries, at present, are coconut, rubber, and sisal hemp, while food crops (rice, maize, cassava, various fruits) are of minor importance, and have to be supplemented by imports. Some of the more valuable indigenous food plants are sugar cane, banana, bread-fruit, and sago palm, together with edible nuts and different kinds of fruit and vegetables.

CHIEF IMPORTS.

	1913.	1921.
Agricultural products and groceries	£72,447	£125,716
Ale, spirits, and beverages	£6,888	£14,550

NORFOLK ISLAND

This Australian Dependency has an area of 13·3 square miles, and the population in 1921 was 717. The soil is very fertile and various subtropical fruits are cultivated, including oranges, bananas, passion-fruits and pineapples. Thousands of lemon trees and guavas grow wild, and the most important exports are preserved lemon peel and lemon juice.

NEW ZEALAND

Total area, 103,861 square miles, of which 577 are accounted for by " outlying " and annexed Pacific islands. The Dominion " proper " has consequently an area of 103,284 square miles. Excluding annexed islands the total acreage is given at 66,292,232, of which barren and worthless land takes up an estimated acreage of 2,530,917—a very small proportion considering the mountainous character of the Dominion. On January 31, 1922, 43,528,337 acres were returned as being in occupation, including reserves and native lands leased, but excluding areas within borough boundaries, holdings of less than one acre in extent, and native land held on the communal system. Of this occupied land 2,016,081 acres were barren and unproductive.

The total population of New Zealand in 1921 was 1,284,873, corresponding to a density of 12·37 per square mile, and representing much closer settlement than in the vast Dominion of Australia, for which the corresponding figure is only 1·87. There is some tendency towards rural depopulation, for an " urban drift " that began in 1906 would appear to be gaining in momentum.

Since the Dominion proper is entirely within the south temperate zone we naturally find an absence of the tropical products distinctive for large areas in Australia and—broadly speaking—the agriculture is comparable to that of the United Kingdom. The Cook Islands and some others are in the tropical zone, so that the Dominion possesses a special source of tropical produce.

Agricultural exports are steadily diminishing, and New Zealand appears to

be well on the way to reduce her agriculture to a level barely sufficient to supply her own plant food-stuffs, except in years of exceptionally high yield. Pastoral exports, on the other hand, are steadily increasing.

I.—Grain Crops and Products.

1. Wheat:

	Acreage.	Total Yield (Tons).	Yield per Acre (Bushels).	1913 and 1921. Imports (Tons).	Exports (Tons).
1913–14 ..	166,774	140,134·8	31·37	121,737	—
1921–22 ..	352,918	282,998·4	29·94	306,257	12·3 (£251)

The large acreage for the latter year was not the result of normal increase in wheat production, but was due to special causes, more particularly to the chaotic state of the wool market in 1921 and the uncertainty that then obtained in the dairy industry with reference to the disposal of products. Under the circumstances farmers regarded wheat-growing as a safer proposition.

As compared with other countries New Zealand takes a high place as regards yield per acre, and this is largely due to the fertility of the soil, for cultivation is less intensive than in the case of closely settled European countries.

Dominion Requirements.—It is estimated that the annual consumption amounts to 7,250,000 bushels, of which 6,600,000 are milled (5 bushels per head of the population), 400,000 used for seed, and 250,000 fed to poultry.

Wheat Flour :

	Imports (Tons). (Australia and Canada.)	Exports (Tons).
1913	2,658·2 (£26,554)	260 (£2,200)
1921	117·0 (£2,574)	113·3 (£2,838)

Macaroni and Vermicelli :

	Imports (Tons). (Australia and Canada).	Exports (Tons).
1913	141·6 (£4,282)	—
1921	126·1 (£7,400)	242 lbs. (£9)

Bran, Pollard, and Sharps :

	Imports (Tons). (Australia and Canada.)	Exports (Tons).
1913	760·4 (£3,767)	1,944·0 (£8,097)
1921	62·5 (£500)	123·6 (£1,373)

2. Barley:

	Acreage.	Total Yield (Tons).	Yield per Acre (Bushels.)	Imports (Tons).	Exports (Tons).
1913–14 ..	32,022	26,911·3	37·65	100 lbs. (£1)	105·9 (£959)
1921–22 ..	33,078	25,698·9	34·80	53·9 (£839)	836·1 (£9,477)

Pearl Barley.—Imports: 1913, 76·7 tons (£1,117); 1921, 42·9 tons (£857). Exports: 1913, nil; 1921, 0·25 tons (£10).

3. OATS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Mostly Australia).*	*Exports (Tons). (Mostly U.K.)*
1913–14 ..	361,741	263,231·1	40·75	30·8 (£387)	4,272·6 (£29,252)
1921–22 ..	170,655	117,568·7	39·56	1,048 (£12,002)	7,704·9 (£84,434)

Oatmeal, Rolled Oats, etc. (including wheat-meal in 1921 exports).—Imports: 1913, 2 tons (£51); 1921, 706·3 tons (£835). Exports: 1913, 10·8 tons (£184); 1921, 14·9 tons (£477).

4. RYE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1921–22 ..	1,233	807·5	24·45	—	113·8 (£728)

5. MAIZE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1921–22 ..	10,522	12,011·3	46·42	1,961·3 (£22,615)	2·7 (£47)

Maizena, Cornflour, etc.:

	Imports (Tons).	*Exports (Tons).*
1913	850·5 (£22,693)	2·0 (£77)
1921	388·6 (£21,884)	1·6 (£106)

6. RICE.—Imports: 1913, 2,955 tons (£42,396); 1921, 2,962·4 tons (£71,352). Exports: 1913, 68 tons (£1,121); 1921, 34·1 tons (£1,441).

Rice-Meal, etc.—Imports: 1,035·5 tons (£4,808) in 1913, and 348·8 tons (£2,324) in 1921.

7. UNSPECIFIED GRAIN (mostly Empire).—Imports (less re-exports) to value of £14,683 in 1913, and £14,828 in 1921.

8. VARIOUS PREPARED CEREALS (mostly Empire).—Imports (less re-exports) to value of £8,849 in 1913, and £5,082 in 1921.

II.—ROOT CROPS.

	Turnips.	*Mangels.*	*Potatoes.*
1913–14:			
Acreage	493,568	10,182	29,164
Total yield (tons)	—	—	157,194
Yield per acre (tons)	—	—	5·39
1921–22:			
Acreage	508,520	10,063	19,418
Total yield (tons)	—	—	112,090
Yield per acre (tons)	—	—	5·80

Imports of potatoes: 1913, 28 tons (£264); 1921, 155 tons (£1,541). Exports of potatoes: 1913, 1,556 tons (£7,443); 1921, 1,216 tons (£9,113).

Other root crops are of minor importance. In 1921-22 the acreage under carrots was 1,816, and that under sweet potatoes (kumeras) 145. The latter are imported from the Cook Islands.

ARROWROOT.—Imports (mostly Australia and Fiji), 16 tons (£556) in 1913, and 24·1 tons (£1,421) in 1921. Exports, 0·42 tons (£14) in 1913, and 0·28 tons (£21) in 1921.

III.—PULSE CROPS.

PEAS AND BEANS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	241·1 (£5,971)	9,115·8 (£89,297)
1921–22 ..	12,789	9,091·0	26·53	92·7 (£4,937)	155·1 (£2,260)

Split Peas.—Imports: 1913, 71·8 tons (£894); 1921, 19·5 tons (£562). Exports: 1913, nil; 1921, 6 tons (£215).

IV.—GRASS CROPS

1. NATURAL PASTURE.—The acreage for the occupied holdings was 23,972,236 in 1910-11, and 14,609,603 in 1921-22.

2. ARTIFICIALLY SOWN GRASSES.—In correlation with the importance of the grazing industry sown grass land heads the list of cultivations. Given sufficient light and moisture, English grasses flourish on land from which bush and fern have been removed. Stock can be wintered on the pastures, for the mildness of the climate secures outdoor keep even during the coldest months of the year. The grazing acreage of sown grass land amounted to 15,925,235 in 1921-22.

Hay:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1921–22	187,363	6,470	—

3. SEED GRASSES AND CLOVERS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	81,871	12,023·72	—
1921–22	91,134	12,134·17	—

4. ENSILAGE.—During the season 1921-22, 1,039 acres of maize were grown for this purpose, and the yield was 6,470 tons. Figures for 1913-14 are not available.

5. CHAFF, ETC.—During 1921-22 considerable acreages of cereals were grown for the production of chaff, hay, or ensilage, as follows:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
Wheat	1,252	2,443	1·96
Oats	344,051	538,194	1·56
Barley	793	1,469	1·85

Figures for 1913-14 not available.

V.—FORAGE CROPS.

During 1921-22, 201,351 acres of cereals and grasses were grown for the production of green fodder. Complete figures for 1913-14 not available, but 220,911 acres were under rape.

VI.—SUGAR CROPS.

The beet sugar industry is not developed, so that sugar and sugar products have to be imported, the particulars being as follows:

1. SUGAR (less re-exports)—mostly Empire, especially Fiji—60,767 tons (£787,631) in 1913, and 62,759·6 tons (£2,014,481) in 1921-22.

2. GLUCOSE (mostly U.S.A.)—708·7 tons (£9,186) in 1913, and 973·9 tons (£20,323) in 1921.

3. MOLASSES.—2,372·6 tons (£3,588) in 1913, and 103·8 tons (£266) in 1921.

4. CARAMEL (mostly Empire).—25·7 tons (£792) in 1913, and 22·1 tons in 1921.

VII.—FRUIT.

The Dominion proper produces a considerable quantity of the chief fruits characteristic of temperate climates, together with a moderate amount of citrus fruit. Bananas, pineapples, etc., are grown in the Cook Islands. The orchard acreages of New Zealand were as follows:

	Private Orchards.	*Commercial Orchards.*		*Total.*
		Not Bearing.	*Bearing.*	
1921–22	5,910	7,604	17,607	31,121

1. FRESH FRUIT.—The yield of commercial orchards (in bushels) for 1921-22 was: Apples, 989,614; pears, 157,261; soft fruits (peaches, nectarines, apricots, plums, cherries), 297,500; citrus (chiefly lemons), 14,404.

Imports: 1913, 9,719·3 tons (£181,663); 1921, 12,840·7 tons (£279,450). Exports: 1913, 674·8 tons (£12,245); 1921, 913 tons (£23,657).

2. DRIED FRUIT:

		Raisins (Tons).	*Currants (Tons).*	*Other Kinds (Tons).*
Imports	1913 ..	1,394·1 (£43,827)	421·4 (£10,978)	1,567·1 (£42,254)
	1921 ..	1,919·4 (183,637)	144·9 (£183,637)	1,735·3 (£83,685)
Export	1913 ..	0·9 (£39)	1·5 (£54)	7·7 (£321)
	1921 ..	80·1 (£6,645)	29·8 (£2,535)	16·0 (£1,766)

3. BOTTLED AND PRESERVED FRUIT.—Imports: 1913, 184,874 dozen (£39,027); 1921, 86,277 dozen (£42,218). Exports: 1913, 1,475 dozen (£500); 1921, 4,604 dozen (£2,972).

4. PEEL.—Imports: 1913, 253·7 tons (£3,990); 1921, 61·4 tons (£2,891); Exports: 1913, 4·6 tons (£38); 1921, 1·1 tons (£153).

5. FRUIT PULP AND PARTLY PRESERVED FRUIT.—Imports: 1913, 16·5 tons (£621); 1921, 94·3 tons (£5,290). Exports, 1921 (to U.K.), 7·9 tons (£452).

6. JAMS AND JELLIES.—Imports: 1913, 282·8 tons (£15,464); 1921, 188·7 tons (£17,106). Exports: 1913, 53 tons (£2,160); 1921, 45·4 tons (£4,329).

7. LIME-JUICE AND FRUIT SYRUPS.—Imports (value): 1913, £4,142; 1921, £7,236. Exports (value): 1913, £74; 1921, £453.

VIII.—EDIBLE NUTS.

1. ALMONDS.—The yield of commercial orchards for 1921-22 included 267 bushels of walnuts. Imports (mostly foreign): 1913, 134·2 tons (£16,810); 1921, 52·1 tons (£10,237). Exports: 1913, 0·2 tons (£12); 1921, 2·1 tons (£430).

2. WALNUTS.—Imports (mostly foreign): 1913, 37·1 tons (£2,566); 1921, 88·4 tons (£7,205). Exports, 1913, 1·9 tons (£64); 1921, 0·3 tons (£36).

3. OTHER EDIBLE NUTS.—Imports (value), mostly foreign: 1913, £9,600; 1921, £18,542. Exports: 1913, £322; 1921, £61.

IX.—VEGETABLES.

There were 4,759 acres occupied by market gardens in 1910-11, and 4,262 in 1921-22. This does not include onions.

1. ONIONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	1913 and 1921. *Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	2,688·2 (£23,928)	658·5 (£4,559)
1921–22 ..	484	4,122	8·2	166·0 (£17,661)	27·0 (£2,662)

2. OTHER VEGETABLES (fresh, dried, or preserved).—Imports (value): 1913, £3,095; 1921, £3,859; Exports: 1913, £630; 1921, £948.

X.—Miscellaneous Imports and Exports for 1913 and 1921.

1. Biscuits.—Imports: 1913, 92·6 tons (£7,644); 1921, 52·6 tons (£11,241). Exports: 1913, 262·3 tons (£6,335); 1921, 77·5 tons (£4,411).

2. Confectionery.—Imports (value): 1913, £141,570; 1921, £149,740. Exports (value): 1913, £580; 1921, £8,608.

3. Infant and Invalids' Food.—Imports (value): 1913, £17,909; 1921, £15,061. Exports (value): 1913, £15,404; 1921, £605.

4. Malt Extract.—Imports (value), 1921, £585. Exports (value), 1921, £51.

5. Sago and Tapioca.—Imports: 1913, 1,250·2 tons (£18,298); 1921, 1,056·6 tons (£2,213). Exports: 1913, nil; 1921, 2·6 tons (£98).

6. Farinaceous Food, Various.—Imports (value): 1913, £2,213; 1921, £1,930. Exports (value): 1913, £26; 1921, £157.

7. Chaff.—Imports: 1913, 1,473 tons (£6,381); 1921, 5 tons (£37). Exports: 1913, 202 tons (£1,176); 1921, 166 tons (£1,532).

8. Various Stock-Foods.—Imports (value): 1913, £12,546; 1921, £7,876. Exports (value): 1913, £626; 1921, £1,183.

9. Oils and Oil Residues. *Olive Oil.*—Imports: 1913, 6,248 gallons (£2,159); 1921, 5,963 gallons (£5,963).

Cocoa Butter.—Imports: 1913, 288·8 tons (£23,992); 1921, 421·1 tons (£61,391). Exports: 1913, 1 ton (£125); 1921, 6 tons (£888).

10. Aerated and Mineral Waters.—Imports (value): 1913, £2,569; 1921, £504. Exports (value): 1913, £712; 1921, £373.

XI.—Potable Alcohol.

1. Spirits, Liqueurs, and Cordials.—Imports (less re-exports) in gallons as follows:

	Brandy.	*Whisky.*	*Gin.*	*Rum.*	*Other Spirits.*	*Liqueurs, etc.*
1913 ..	73,604 (£39,460)	732,679 (286,243)	127,204 (£35,320)	17,693 (£4,373)	12,980 (£6,143)	4,982 (£4,622)
1921 ..	47,023 (£61,535)	702,224 (£666,482)	43,815 (£37,481)	7,869 (£7,600)	7,494 (£4,311)	3,727 (£6,550)

2. Malt Liquors. (*a*) *Malt.*—Imports, 2,705 bushels (£964) in 1913, and 2,791 bushels (£1,812) in 1921.

(*b*) *Hops :*

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Cwts.).*	*Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	39·0 (£5,790)	223·0 (£22,760)
1921–22 ..	54[a]	303·4	11·2	8·6 (£3,702)	44·9 (£19,142)

(*c*) *Ale, Beer, and Porter:*

	Production. (*Thousands of Gallons*).	*Imports* (*Gallons*).	*Exports* (*Gallons*).
1913–14 ..	—	293,012 (£57,854)	16,821 (£1,988)
1921–22 ..	14,323·1	23,966 (£11,353)	10,261 (£3,038)

3. WINE.—There is a small vineyard area in North Island, the acreage being 179 in 1921-22. Most of the crop is used for wine-making, though a part is devoted to table grapes.

Imports (gallons): 1913, 145,098 (£67,034); 1921, 111,715 (£106,606). Exports (gallons), 1913, 1,882 (£2,568); 1921, 3,144 (£4,667).

ISLANDS ATTACHED TO NEW ZEALAND

These include the Cook and some other islands, of which the population in 1921 was 13,209 (360 Europeans). The chief exports (mainly to New Zealand) are fruit and copra. In 1921 the following number of cases were exported: Oranges, 57,169 (£22,343); bananas, 52,388 (£21,680); tomatoes, 34,457 (£11,169). Other items were coconuts, pineapples, lemons, mangoes, sweet potatoes (kumeras), and arrowroot. The fruit industry is susceptible of considerable development.

FIJI

Area, about 7,083 square miles. Population (1921), 157,266 (3,878 Europeans). The islands are extremely fertile, and some of the exports, particularly sugar, are of great importance.

	1913.	
	Acreage.	*Total Yield.*
Maize	3,397	104,096 bushels
Rice	13,508	29,687 tons
Yams	313	252 „
Beans	3,274	11,111 bushels
Sugar cane	48,208	736,992 tons
Bananas	6,608	668,095 bunches
Pineapples	99	500 cases
Coconuts	32,915	167,668 (number)

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	1,909	742
	£	20,865	12,496
Flour: sharps and pollard ..	Tons	5,931	4,917
	£	50,883	77,198
Biscuits	Tons	623	582
	£	17,037	26,164
Spirits	£	11,360	27,481

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Sugar	Tons	94,710	72,624
	£	1,041,927	2,053,405
Bananas..	£	168,249	—

PACIFIC ISLANDS

The chief islands here included are the British Solomon Islands, Gilbert and Ellice Islands (with Fanning Island, a Pacific cable station), Tonga or Friendly Islands, Phœnix Islands, Pitcairn Island, and the New Hebrides, which have a collective area of about 17,080 square miles, and an approximate population of 268,500 (2,218 Europeans). The copra industry is of greatest importance, but there is some export of maize, arrowroot, and fruit.

GILBERT AND ELLICE ISLANDS: CHIEF IMPORTS.

	1919–20.
Provisions	£52,906
Potable alcohol	£2,131

TONGA PROTECTORATE: CHIEF IMPORTS.

	1913.	1921.
Flour	£6,128	£10,431
Biscuits	3,215	5,284
Sugar	2,988	7,785
Pickles and oilstores	3,086	4,101
Beer, ale, and porter	859	1,751
Spirits	752	4,220

SECTION III

SUMMARY AND CONCLUSIONS

ALTHOUGH this particular volume of the Series is only concerned with food of vegetable origin, and therefore deals with agriculture in the limited sense (animal food products are dealt with in the next volume), horticulture, and allied industries, the introduction of certain generalities is unavoidable. Owing to the disintegration of Europe as a result of the War, civilization, including trade and commerce, has been thrown into the melting-pot, and before a new order of things has evolved and become stabilized far-reaching reorganization will be necessary, and the British Empire is fully alive to this, as shown by the deliberations of the Imperial Economic Congress. We are trying to adjust ourselves to a fresh set of conditions, and what we do now will profoundly influence, not only the future of the Empire, but the future of the world.

The realization of the ideal of a self-feeding Empire, so far as essential commodities are concerned, is not an impossibility, while a certain amount of progress in that direction is generally regarded as essential; but to produce an exportable surplus of goods is useless without the necessary markets for disposal. While the consolidation and expansion of inter-Empire trade may do much in this direction, we shall always depend to a greater or less extent on other countries as customers, and imports from such countries will always bulk largely in our trade returns. If the countries that fought together in the War would heartily co-operate in peace, the progress towards stabilization of trade might be accelerated. There are also some non-British countries in which we have a large financial stake, such as Egypt and the Argentine, and these would naturally be taken into account in reorganization activities.

Agriculture is, and always must be, a fundamental industry, and requires to be put on a sound basis if advances in other directions are also to be sound. It is not only the question of food production, but of the maintenance of a healthy rural population, upon which urban centres depend for renewal of their vitality.

DEVELOPMENT OF EMPIRE FOOD RESOURCES

The present time is very opportune for endeavouring to develop any or all the resources of the Empire, as the relations between the home country and the overseas Dominions have never been so close, largely owing to the intimate association brought about by fighting together for nearly five years. Sentiment is more important as a business asset than commonly supposed, but its value

must not be overestimated. Although the average Briton would doubtless prefer, other things being equal, food produced by the Empire to that imported from foreign countries, his purchases mainly depend on prices, and the average purchaser is little, if at all, concerned with country of origin. The educational importance of the British Empire Exhibition in this, as in all other respects, can hardly be overestimated.

Nor must we forget that sentiment cannot be expected to appeal to the enormous native populations of the Indian Empire and the Crown Colonies, who quite naturally eat what suits them, without thinking or even knowing about its origin, and determining their choice, if there be any, by price alone.

The maintenance and intensification of the cordial spirit now existing between Britons living in all parts of the Empire depend primarily on sound *migration policy*. The value of sentiment is here illustrated by the success which seems likely to attend the " county " scheme for Australia. For a group of persons, say from Devon, to settle down together overseas removes a common objection to leaving the home country. It is, indeed, grafting a bit of " home " into the vital organization of a Dominion. Even the recent adoption of the word " migration," to signify movement from one part of the Empire to another, as against " emigration," which we now use to signify leaving home for a foreign country, stresses the practical value of sentiment.

As already pointed out (pp. 19-20 and 34), the development of the United Kingdom food resources is necessary as a means of *National Defence*. This was clearly realized during the War, when the intensive submarine campaign of the enemy made short commons the order of the day for a considerable time, and stimulated agricultural production in these islands to an extent hardly credible. Over half a million tons of wheat, etc., went to the bottom of the sea in the course of two years as the result of enemy action. Germany, on the other hand, was in possession of a well-developed and organized farming industry, and this enabled her to carry on for nearly five years, in spite of a vigorous blockade. We resolved at the time never to be caught again, and to maintain a largely increased acreage of arable land. But the War once won, economic forces prevailed, and our new plough lands speedily tumbled down to grass. This may have been inevitable, but it is always wise to prepare for the worst, and in this particular matter it should never be forgotten that the marvellous development of aircraft has robbed us of our insularity and made us, for military purposes, part of the Continent of Europe.

The development of our Empire food resources beyond the minimum necessary for safety is, of course, a question of economics. The rise of industrialism in this country has been accompanied by a rapid increase in population. When the first general Census of Great Britain and Ireland was taken in 1801 this stood at 16,345,646, and the following figures, for twenty-year periods, will speak for themselves: 1821, 21,272,187; 1841, 27,036,450; 1861, 29,321,288; 1881, 35,241,482; 1901, 41,976,827; 1921, 47,157,747 (as no census was taken in Ireland that year the Irish figures for 1911 have been added in). Some slight reduction in density has taken place since the War, since our migrants and emigrants taken together have exceeded the immigrants to this country in number.

Figures as follows:

	Migrants.	*Emigrants.*	*Migrants plus Emigrants.*	*Immigrants.*
1919 ..	136,657	43,575	201,504	193,601
1920 ..	246,630	105,799	437,879	283,705
1921 ..	188,552	79,707	377,507	227,583

(Europe is not considered in above figures.)

As the United Kingdom became more and more industrialized, and the population increased, the demand for cheap food became greater and greater. At the same time, the insidious process of rural depopulation—migration from the country to the town—steadily depleted the man-power necessary for increasing agricultural production. For a long time our farmers were able to satisfy a large part of the food demand, but the importation of foreign food, especially American wheat, became necessary to meet the rest of that demand. This importation began in 1765, and the amount imported has steadily increased, other commodities being continually added to the list, until now the bulk of our food comes from overseas.

We were able to feed ourselves, for the most part, well on into the nineteenth century, since production was largely increased by improvements in farming adopted as a result of the Napoleonic Wars. During the first ten years of last century our average annual import of wheat only amounted to 600,000 quarters, and during the following decade the average was even reduced to 458,578 quarters. A period of fictitious agricultural prosperity followed the peace of 1815, but the repeal of the Corn Laws in 1846 marked the definite adoption of a cheap food policy, which has resulted in steady diminution of home-grown supplies. Nevertheless, farmers continued to hold their own for a considerable time, in spite of a severe depression in 1849-52, followed, however, by a period of great prosperity, due to rise of prices brought about by the Crimean War, the discovery of gold-fields in California and Australia, and striking improvements in agricultural practice. Decline then set in, but our farmers did pretty well in the early seventies, partly owing to inflation of prices by the Franco-Prussian War, though the competition of American wheat began to be serious in 1872. The year 1875, however, marks the beginning of a period of depression (particularly serious in 1884 and 1893), accentuated by a series of bad seasons, of which the most disastrous was in 1879. The following table shows the stages in reduction of arable, wheat land, and production, and increase in imports of wheat and flour from 1870 to 1914:

	Arable Acreage.	*Wheat Acreage.*	*Home-Grown Wheat (Quarters).*	*Imported Wheat and Flour (Quarters).*	*Percentage Home-Grown.*
1870 ..	24,092,075	3,761,457	13,419,496	8,661,427	64·1
1880 ..	22,869,608	3,058,074	5,905,020	15,973,956	27·0
1890 ..	20,929,868	2,478,677	9,499,235	19,222,371	33·1
1900 ..	19,528,408	1,898,863	6,790,262	23,006,072	22·8
1910 ..	19,603,821	1,856,485	7,074,179	27,779,886	20·3
1914 ..	19,414,166*	1,904,932	7,804,041	27,509,831	22·1

The position as regards wheat may be summarized by stating that the decline in British agriculture has resulted in only one-fifth of our requirements being home grown. From the Empire point of view the position might be much worse. Originally we were obliged to rely entirely, or mainly, upon foreign sources of supply, especially the United States and Russia; but now a considerable part of our imported wheat comes from the Dominions, especially Canada, the Empire produces enough wheat for its own requirements, and its powers of production are capable of large extension. If it were possible to adjust distribution the Empire would be able to dispense with foreign wheat altogether, and also to export to other countries. It is, of course, a matter of cost of production and cost of transport.

From what has been said it will be realized that the United Kingdom has become so industrialized that food production has declined to an extent only justifiable under conditions of continuous world peace—conditions that have yet to be realized. So long as our Navy and Air Force are sufficiently powerful to guard with efficiency the ships that bring our imported food to us, we are not likely to be starved out in the event of prolonged war. But in any case we cannot expect our Dominions and Colonies, and the Empire of India, to be content with producing food and raw materials. They, in their turn, are likely to be increasingly industrialized. The manufactures of Canada are already very important, and Australia, despite her scanty population, is vigorously endeavouring to develop industries of every kind. Even in New Zealand, so eminently adapted to agriculture and pastoral production, the " urban drift " is making itself felt.

If we consider the history of any civilized country it will always be found that food production becomes more or less subordinated to industrialism as time goes on, and this is associated with an increase in material prosperity, always provided the process does not go too far. It has certainly gone too far when the food supply is mainly of foreign origin. Should such a stage ever arrive in the evolution of the British Empire, as a result of the demand for cheap food for those engaged in manufacturing industries, the foreign countries supplying the food would be able to raise their prices and the food would cease to be cheap. Besides, as previously emphasized, urban vitality largely depends on the existence of a healthy and vigorous rural population. Sir Daniel Hall deals with this aspect of the agricultural question in a striking passage of his book *Agriculture after the War* (pp. 15, 16):

" A population dependent entirely upon manufactures gives rise to an unstable State, subject to comparatively violent fluctuations of employment from causes which are liable to affect all industries simultaneously. An agricultural community alongside the industrial one serves as a reservoir for labour, absorbing the fluctuations because its own variations depend upon different factors, and so equalizing the demand. Politically a country population is the more sober and cautious, because it is in touch with certain fundamental aspects of existence that are hidden away from the purely town dwellers. No one concerned with the ultimate welfare of our nation can view with equanimity the tendencies of the last half-century, the continuous depopulation of the country and the growth of the towns.

If the process continued our State would become economically parasitic upon the more primitive food-producing countries; and a parasite, however highly organized, cannot continue to exist if the connection with its host is severed."

METHODS OF INCREASING EMPIRE FOOD PRODUCTION

The problem here awaiting solution differs in character in the various parts of the Empire. At least three cases require consideration: (1) The strongly industrialized—if not over-industrialized—United Kingdom, which is more dependent on imported food than any other country. (2) Dominions such as Canada, Australia, and New Zealand, with a mainly British population, and, at present, having a surplus of food for export. (3) The Empire of India, the Union of South Africa, and the Crown Colonies, where the native population largely predominates, which export many kinds of food, but also import others. The last feature applies more particularly to our tropical Colonies, which are not adapted to close settlement by Europeans.

I.—The United Kingdom.

The decline of agriculture, as already indicated, has been simply a matter of economics, a question of prices, and the revival in the industry that took place during the four years before the outbreak of war demonstrates that under normal conditions our farmers are able to make good in spite of strong foreign competition. They are still able to do so as regards live-stock and animal products, but have frankly admitted their inability to maintain, far less increase, their present output of wheat and other cereals for human consumption without some kind of assistance from the State. This unfortunate state of things has been brought about, very largely, by the necessary increase in the post-war labour bill and the repeal of the short-lived Corn Production Act, necessitated by financial considerations.

It is important to remember here that reduction in the area of arable land affects not only the agricultural community, but the country as a whole. Far less labour is required for grazing land than for arable, and the conversion of 3½ million acres of arable into grass land during the forty years following 1872 threw 261,000 men out of employment in agriculture—seven men for every hundred acres. There can be no doubt at all that reduction in the amount of arable at the present time would swell the lamentably long list of those unemployed and add to the burden of the taxpayer.

An Agricultural Tribunal of Investigation was appointed by Mr. Bonar Law at the end of 1922, its reference being "... to enquire into the methods which have been adopted in other countries during the last fifty years to increase the prosperity of agriculture and to secure the fullest possible use of the land for the production of food and the employment of labour at a living wage, and to advise as to the methods by which those results can be achieved in this country."

In its second interim report, issued in November, 1923, the Tribunal express it as their opinion that direct action by the State is necessary if further

substantial decline in the tillage area is to be prevented, and after considering the various possible ways in which financial assistance might be given, recommend a subsidy.

"We recommend a subsidy of 10s. per acre on all arable land (that is, all land ploughed during the year, including summer fallow, but excluding land under clover and grass seeds, small fruit, orchards and hops), and an additional subsidy of 10s. per acre on all land under wheat. The cost of this proposal on the present tilled area of about 10,350,000 acres would be some £5,175,000, and the cost of the additional subsidy on wheat £900,000, making a total of £6,075,000. This scheme may cause some increase in the tilled area, but we do not anticipate that it is likely to rise much above 11,000,000 acres, or the wheat area much above 2,000,000 acres. On this basis the subsidy would cost £6,500,000, and we regard this sum as practically the outside limit."

"It may be asked why wheat should be singled out for special benefit. We would reply that it is the main factor in the maintenance of arable farming in England, that it is the most essential food-stuff, and that it is the crop which has suffered most by the fall in prices. The present price of wheat is only 19 per cent. above the pre-war level, whereas the index number for agricultural produce generally is 53 per cent. above pre-war, and it does not seem likely that the price of wheat will materially improve. It is significant, too, that two-thirds of the decline in the total arable area in England during the last fifty years is accounted for by the shrinkage in the acreage under wheat and barley."

"In making our recommendation we are of opinion that, in order to place a premium on good farming, the Minister of Agriculture should have power to reduce or withhold altogether the subsidy in cases where he is satisfied that the farmer has not cultivated his holding according to the rules of good husbandry as defined in the Agriculture Act, 1920, and we consider that the county agricultural committees should be charged with the duty of furnishing the Minister with the necessary information."

State subsidy, however, is not the only method for improving the position of agriculture in this country. It is often forgotten that farming is a very complex and difficult matter, involving not only the innumerable details connected with production, but also a business side. The best type of British farmer is an expert producer, though in many cases there is ample scope for improvement in practice. But it cannot be said that the average farmer is a good man of business, nor, indeed, has he much time to spare for the purely financial side of agriculture. There are, it is true, outstanding men who are not only expert producers, but thoroughly skilled in the art of disposing of their produce to the best advantage; though from the nature of the case such men are always likely to be in a very small minority. Hence it follows that farmers, in the main, fail to secure their fair share of the profits of their industry, an undue proportion of which is absorbed by middlemen and retailers.

The great expense of inland transport, especially in the case of wheat, imposes a heavy load on arable farming. As Mr. Hugh R. Rathbone justly remarks (*The Staple Trades of the Empire*, p. 150):

" Railway carriage of wheat in this country for long distances is almost prohibitive, and for this reason . . . the milling industry has more and more gravitated to the seaboard. Under normal ocean freight conditions it is generally cheaper to move grain from Chicago to Liverpool than to carry it from Lincolnshire to Birmingham. Those who have studied the railway question in the matter of remuneration of long hauls will know that rates are often lower for the long haul, including a long ocean voyage, than they are for a small part of the haul in this country. Thus it may be cheaper to bring grain from New York to Birmingham via Bristol than it is to take grain from the Bristol neighbourhood to Birmingham. On the face of it this differentiation in favour of the longer haul often seems unfair and illogical, but there is much to be said on the other side. It is a highly complicated question, and can only be alluded to here as one of the difficulties our internal traffic has to face."

The question of railway carriage will receive attention in the volume on Transport in this Series, and it must suffice to mention it here as one of the difficulties with which the farmers of the United Kingdom have to contend.

Primarily in the interests of the consumer, a Departmental Committee, with Lord Linlithgow as chairman, was appointed at the end of 1922 " to enquire into the methods and costs of selling and distributing agricultural, horticultural, and dairy produce in Great Britain, and to consider whether, and if so by what means, the disparity between the price received by the producer and that paid by the consumer can be diminished." The findings of this Committee have been embodied in a final report, and four interim reports were made, one of these being on " Cereals, Flour, and Bread," in which the following conclusions are reached:

" We have investigated the system of distributing cereal crops and find it to be, on the whole, both simple and inexpensive. So far as the manufacture and sale of bread is concerned, we have shown that the time has come for many bakers to reduce their prices consequent on recent reduction in costs, notably in the price of flour."

" We have emphasized that, as the farmer cannot look for any immediate and material improvement in the prices he obtains for his wheat by alterations and economies in the established methods of production and distribution of either flour or bread, steady and permanent improvement in prices is to be sought by enhancing the intrinsic commercial value of the wheat he grows. This he can do by concentrating on the production of newly evolved varieties of wheat of high milling quality. Indeed, up to the limits of available supply, there is even now no reason why consumers should not be supplied with a high-class all-English loaf if farmers will grow suitable wheat, if millers will manufacture the flour, if bakers will use it, and if all three combine to make the merits of this all-British product known to the public. The creation of an articulate demand is essential. The natural play of economic forces will determine the course events will take, but if for wheat of high milling quality the farmer ultimately obtains the higher price to which he is or will be fully entitled, while, at the same time, improved varieties yield satisfactorily, wheat production in this country would receive much-needed encouragement."

It seems probable that the solution of the general problem of how to improve the business side of agriculture will be solved by some method of co-operation. This has undoubtedly worked wonders in Denmark and Sweden, as is sufficiently attested by the facts, and by the testimony of those who, like the present writer, have had the opportunity of studying the matter in the countries concerned. There we find intensive and highly skilled production associated with an excellent business system. One secret of the success of Danes and Swedes in agriculture is undoubtedly to be found in their superior system of education, which puts our own entirely in the shade.

Agricultural co-operation in this country has not met with the success it merits, partly owing to our inherent conservatism as to methods, our lack of enthusiasm for education, and the apathy of the State. But the wonderful work done by Sir Horace Plunkett in Ireland shows what can be effected by co-operation even in the face of great difficulties. The complete reform of the egg industry in the sister island is one of the most striking instances of its efficiency. Originally, eggs—of variable and often unknown age—were collected by "higglers," who secured the lion's share of the profits. At that time the "Irish egg" was a very doubtful quantity, though often of undoubted value in times of political crisis. Ultimately the system was so reformed that Irish eggs were collected, graded, properly packed, and put on the English market within three days of being laid, and the producer received his fair share of the profits.

It can, at any rate, be confidently asserted that purely agricultural small holdings, with the rarest exceptions, can only be made an economic success by the adoption of co-operative measures.

One of the prime causes of rural depopulation before the War was the low rate of remuneration of the agricultural labourer, by no means an "unskilled" worker, as often supposed by the town-dweller. It seems improbable that his wages will be allowed to revert to the old scale. Consequently the difficulty of an increased labour bill is likely to be permanent. But there are many cases where adoption of improved, up-to-date methods, and the exercise of greater care in business transactions, might do a good deal more than meet this extra post-war expense.

The question of labour-saving machinery is naturally of great importance in this connection, especially in cases where acute shortage of labour is experienced. Notable advances in this respect have been made in the past, and the introduction of the self-binder affords a striking example of certain possibilities. There is no reason to think that further progress in this direction will cease in the future, but unfortunately elaborate mechanical devices do not justify their cost on small farms, of which there are so many in this country, and are almost entirely ruled out in the case of small holdings.

Some of the results of agricultural research, in their practical application to farming, are beginning to exert an important influence in various ways, particularly by saving unnecessary expenditure, increasing yield, and reducing wastage of crops. Expert advice on what may be termed the scientific side of agriculture is easily obtainable, at small and often no expense, in practically every county, but it may be doubted whether the average farmer takes full

advantage of this. Manuring, for instance, is a highly scientific matter, and there can be no doubt at all that large sums of money are often spent on manures of unsuitable kind for the end in view; while, on the other hand, the yield of a particular crop may be very inadequate for lack of expenditure on the fertilizer it requires. And even though a farmer may purchase the most suitable kind of artificial manure he may not secure full value for his money. The selection of suitable varieties is also a matter of great importance, and much may be expected from the results of scientific plant-breeding, some of which have been very striking, such, for instance, as the production of rust-resisting varieties of wheat. Weeds, rats, and pests of fungoid or insect nature levy an enormous toll upon our crops, fruit, and vegetables, and this loss can only be minimized by the employment of measures which are the outcome of scientific research.

FRUIT-GROWING is a national industry of great and increasing importance, not only as regards the production of fresh fruit, but also in relation to jam and preserved fruit, syrups, cider, and perry. It has only been put on a fairly sound footing of recent years, mainly as a result of competition with imported fruit, which originally commanded higher prices on the market, chiefly owing to better grading and packing. The industry, as now reformed, owes much to scientific research, more particularly as regards the control of fungoid and insect pests, which are even more troublesome than in ordinary agriculture. In many cases grading and packing receive adequate attention, and ultimately we may hope to see the best methods employed everywhere.

In certain parts of the country, particularly the West of England, cider has always been the favourite form of potable alcohol, and its quality has been greatly improved of late years, largely as the result of the research work done at the Agricultural and Horticultural Research Station (formerly the Fruit and Cider Institute) at Long Ashton, near Bristol. There is no reason why, in the course of time, cider should not become a serious rival of the lighter kinds of imported white wine. The consumption of perry, or pear cider, is small and mostly local, probably because most persons are unaware of its existence. But, next to cider, it has a good claim on those who appreciate the merits of white wine as a beverage.

VEGETABLE GROWING may be regarded as a highly intensive form of agriculture, and, like fruit-growing, is highly indebted to scientific research in the matter of fungoid and insect pests. Our supply of vegetables is, from the nature of the case, largely home-grown, but the imports are not inconsiderable, and there seems no reason why we should not reduce these by increasing home production. The super-intensive method of French gardening, which once seemed likely to find favour in this country, is now little practised, but it possesses considerable possibilities and deserves a more extended trial.

While purely agricultural small holdings, run without co-operation, have not proved a success, the opposite is true for some holdings of the kind which have been devoted to raising fruit and vegetables. Given a suitable soil and marketing facilities there might very well be some possibility of extending this kind of enterprise. Although fruit-growing is always admittedly risky in the

absence of appreciable capital, vegetable-growing is a much safer speculation, for this is not a case of putting all your eggs into one basket.

In the growing of fruit and vegetables, as in ordinary agriculture, the questions of relative share of profits and of marketing are of primary importance. The second interim report of Lord Linlithgow's Committee deals with these commodities. It is full of interesting information, makes a number of important suggestions, and reaches certain general conclusions. We are told that: "The fruit and vegetable industry is unique in the number and variety of intermediaries who may, at times, be engaged in handling the produce, and whose sole service is that of distribution. In the case of other commodities, distributive services more usually include, not only the operations of collection and distribution, but also the preparation and treatment of the produce to render it more adaptable to the consumer's needs."

The industry is greatly handicapped by heavy railway charges by which, for example, early Cornish broccoli is unable to compete in our northern markets with imported produce. There is also much need for more co-ordination between the various interests concerned. There is room for much improvement in grading and packing, and the use of standardized containers is strongly recommended. Considering the perishable nature of the commodities handled and the surplus available for canning, it is somewhat remarkable that the home market for tinned fruit is left to importers, while the preservation of vegetables by canning is almost wholly undeveloped in this country. Attention is called to the research factory at Campden (in co-operation with the Long Ashton Institution), which is conducting experiments on the preservation of fruit and vegetables, by canning and in other ways.

It is also interesting to learn that the high price of jam, mainly due to dear sugar, has resulted in a decrease in consumption in favour of margarine, which can be produced more cheaply.

The report, in its final conclusions, states that:

"... The picture presented to us by the evidence we have received is that of an industry deeply disturbed by war and post-war conditions. The less progressive growers and distributors appear to be waiting for the return of pre-war conditions. The more progressive growers and distributors, on the other hand, are fully alive to the needs of the moment. Perceiving the widespread change in prices and conditions of trade which are the aftermath of war, they are earnest in their endeavour to improve the methods and to lessen the cost of the various processes, whether of production or distribution, in which they are engaged. The best hope for the future lies with the industry itself. Producers must realize that marketing is the other half of production. They must make it their business to increase their knowledge of market conditions and requirements in order to dispose of their produce in the home markets to the best advantage in competition with produce grown in other lands. Distributors, for their part, must make every effort to eliminate archaic methods and to enhance the efficacy of the general distributive system. Retail distributors, in particular, should make serious efforts in the direction of increasing turnover when supplies

are abundant, by charging lower prices to the consuming public. It should be the aim of all concerned in the industry to facilitate the passage of fruit and vegetables from the land to the home. The policy of preferring high prices and smaller turnovers to increased business on a lower price basis checks the even flow of supplies, and is inimical to the interests of the retailer himself, as indeed to the interests of all."

II.—Dominions with Mainly British Population and Producing a Surplus of Exportable Food.

The facts already set forth with regard to Canada and Australia demonstrate their great importance as food producers and exporters, and the further development of their almost unlimited resources is primarily a question of man power. It is only the large use of labour-saving machinery, for which the conditions are suitable, that enables them to produce so much. Encouragement of migration, always provided the migrants are of suitable character, is urgently necessary in their interests and in our own, and it may be said that the solution of many Empire problems is largely dependent on judicious redistribution of Empire population. It need hardly be said that capital is welcome as well as labour, and there is plenty of room not only for agricultural and horticultural labourers, but also for those who intend to be employers of labour in the sphere of food production.

New Zealand is in a different position with regard to migration, and her resources are more fully developed, as might be expected with the comparatively dense population of 12·57 per square mile. There is still room, however, for a considerable number of trained male agricultural workers, provided they are unmarried, though some places are available for married men without families.

It is much to be hoped that Canada will take advantage of the disorganization of the European beet sugar industry to increase production in that direction, while the possibilities of extending the cane sugar and tropical fruit industries in Queensland are very considerable.

More intensive cultivation, resulting in a larger yield per acre, will doubtless, as time goes on, be practised in Canada and Australia, and even in New Zealand some advance in this direction is possible. All three Dominions make full provision for agricultural education and expert advice. In Canada, where winter means cessation of activities on the land, admirable practical and theoretical instruction is given during that season, so that the Canadian farmer has the opportunity of keeping up to date.

As will be seen from the data furnished in Section II., the three Dominions in question are making steady advances in the working up of various harvested products, not only meeting their own requirements, but producing an exportable surplus of commodities lending themselves to more economical transport than the raw food. Among these are flour and other cereal products, refined sugar, canned fruits, and, in the case of Australia, dried fruits and also wine, especially that of improved quality.

Preferential tariffs, already in force to some extent, naturally stimulate inter-Empire trade in food of vegetable nature or origin, and help materially towards the ideal of a self-feeding Empire. The United Kingdom depends for its prosperity upon exports, and benefits directly as the other parts of the Empire become more wealthy, and absorb an increasing amount of such exports.

Much depends, in the promotion of inter-Empire trade, upon transport and other complex matters upon which the exchange of commodities depends, and here an exhaustive investigation is necessary. This will doubtless be an important part of the work discharged by the Committee which has been established as one result of the recent Imperial Conference. CANADA is relatively near the United Kingdom, but the length of the sea-route by which this is separated from AUSTRALIA and NEW ZEALAND considerably increases the cost of transit. From the direction which trade is taking, however, there can be no doubt that the two latter Dominions will play an increasingly important part in exporting food to the African and Asiatic parts of the Empire, and they are in addition the natural emporia for the smaller British possessions in the Pacific. The corresponding import trade, already considerable, will doubtless attain much larger dimensions. There is some volume of trade in food of vegetable nature or origin between Australia and New Zealand. Australia, for example, buys a considerable quantity of hops from New Zealand, whom, on the other hand, she supplies with wheat, raisins and wine.

Other details regarding Canada, Australia, and New Zealand may be gathered from the following figures and statements, taken from the official year books.

CANADA.

TRANSPORT.—The last official report of the Dominion Bureau of Statistics showed 39,771 miles of railway in operation on January 1, 1922, as compared with 39,384 miles on January 1, 1921, 30,795 miles in 1914, and 17,657 miles in 1900. On October 5, 1922, the Grand Trunk Railway came under Government control as part of the Canadian National Railway system. During the navigation season the waterways of Canada are of great importance, but the winter stagnation of business has only been prevented by the construction of railways. "The steam railway was required for the adequate economic development of Canada, more particularly for linking up with the economic and industrial world the vast productive areas of the Canadian west, and thus promoting their development. The construction of the Canadian Pacific Railway gave to Canada as an economic unit length, but it was 'length without breadth.' The building of the newer transcontinental railways has for the first time given the country breadth—a fact which in another ten years, as settlement fills the extensive areas thus opened up, will be more evident than it is to-day" (1921 *Year Book*, p. 521).

FACTORIES.—The industrialization of Canada has involved the setting up of factories concerned with working up products of vegetable origin, as will be seen by inspection of the following figures for 1919:

	Number.	Cost of Materials. (Thousand $).	Value of Products. (Thousand $).
Biscuits and confectionery	325	28,306·7	52,238·1
Bread and other bakery products	1,690	33,682·5	52,318·4
Evaporated fruits and vegetables	77	951·8	1,676·3
Flour and gristmill products	1,255	229,835·7	262,786·7
Fruit and vegetable canning	129	14,027·8	16,017·6
Jams and jellies	40	6,540·7	9,042·8
Macaroni and vermicelli	9	657·9	1,152·6
Maple sugar and syrup	3	654·6	988·8
Prepared flour	3	191·2	260·1
Rice cleaning and polishing	7	4,011·0	4,603·8
Sugar, refined	8	86,308·2	102,630·0
Vinegar and pickles	34	2,122·3	4,267·5
Aerated and mineral waters	320	3,385·5	7,366·7
Liquors, distilled	5	724·2	1,288·4
,, malt	57	8,093·4	20,169·0
,, vinous	16	685·5	1,527·7
Malt	7	2,374·9	3,468·8

ADMINISTRATION AND EDUCATION.—The remarkable progress which has been made in all branches of agriculture and horticulture is very largely due to effective administration by the Dominion and Provincial Governments. For the Dominion there is a Department of Agriculture presided over by a Minister, under whose direction are numerous specialists, including those concerned with experimental farms, seeds, cereals, grasses, horticulture, entomology, and chemistry. Most of the Provinces have their own Ministers of Agriculture with official staffs, and maximum efficiency is in all cases secured by complete correlation. There is an admirable system of agricultural education, adapted for students of all grades.

AUSTRALIA.

TRANSPORT.—On Government and private railways the mileage increased from 18,012 in 1910-11 to 26,202 in 1920-21. Many new lines are under construction, so that as agricultural production is increased the means of distribution will be proportionally augmented. Similar activity has been and is being shown in road extension and improvement.

FACTORIES for dealing with agricultural and horticultural produce are increasing in number, and some idea of their output may be gathered from the following table for 1920-21:

	Number.	Cost of Materials (Thousand £).	Value of Products (Thousand £).
Biscuits, etc.	53	2,180·4	3,270·2
Jams, pickles, and sauces	154	3,465·5	5,262·6
Confectionery	200	3,421·4	5,419·9
Flour mills	184	15,987·0	18,092·3
Sugar mills	37	3,733·7	5,511·9
Breweries	67	3,341·7	7,572·8
Distilleries	37	436·4	669·3

ADMINISTRATION AND EDUCATION.—The administrative machinery for the Commonwealth and its constituent States is comparable in general arrangement to that described for Canada, and of equal efficiency, and there is the same admirable provision for agricultural education.

NEW ZEALAND.

TRANSPORT.—The length in miles of the Government Railways was 2,851 in 1913, and 3,021 in 1922, there being also about 135 miles of private railways in the latter year. The mileage of roads was ascertained for the first time in 1920-21, when it was estimated at about 64,328, of which 44,462 miles were "formed" roads, the rest being "unformed" roads and bridle-tracks.

FACTORIES.—Some of the details concerning factories engaged in working up foods of vegetable origin are as follows for 1920-21:

	Number.	*Cost of Materials (Thousand £).*	*Value of Products (Thousand £).*
Grain-milling	53	2,819·3	3,426·9
Biscuits and confectionery	51	792·2	1,270·9
Fruit-preserving and jam-making ..	10	208·3	316·6
Brewing and malting	56	648·5	1,463·5
Sauce, pickle, and vinegar making ..	15	119·6	184·5

ADMINISTRATION AND EDUCATION.—There is a Minister of Agriculture presiding over a Board divided into various branches, of which the most important are concerned with the pastoral industry, the remarkable advances made in which are dealt with in the second volume on Food Production. There are experimental farms and areas for agriculture and horticulture, which are annually visited by thousands of farmers, many of whom carry out experiments on their own farms. A Board of Agriculture advises the Minister on matters relating to the development of agriculture and other rural industries in the Dominion.

An Agricultural College at Lincoln provides instruction for students of all grades.

III.—PARTS OF THE EMPIRE WITH MAINLY NATIVE (NON-EUROPEAN) POPULATION, AND PRODUCING OR ABLE TO PRODUCE AN EXPORTABLE SURPLUS OF FOOD OF VEGETABLE ORIGIN.

The overwhelming preponderance of native non-European populations throughout a large part of the British Empire raises a number of general problems. These, or rather some of them, can only be briefly considered here in so far as they affect food production. The question of climate is also of outstanding importance, for some of the tropical or semi-tropical parts of the Empire, such as Sierra Leone or the Gold Coast, are clearly not adapted for settlement by the white races on any scale. On the other hand, the Union of South Africa, Rhodesia, and over 12,000 square miles of the Kenya Colony lend themselves to such settlement, and there is still some room for white migrants in the British West Indies.

1. The EMPIRE OF INDIA is still in the food-producing stage, though in some centres industrialization is beginning, and the operations of agriculture and the allied industries are carried out by native labour. Indians themselves are taking an increasingly large share in the administration and development of their country, including the many activities connected with trade and commerce. The European population is relatively very small, and there is here no field for migration from this country—indeed considerable areas, such as Burma and South India, are not in any case adapted for absorbing part of the excess population of the United Kingdom. India, in fact, has her own migration problems, which are sufficiently well known, and supplies agricultural labour to some other parts of the Empire—*e.g.*, Mauritius, Fiji, and British Guiana.

As already indicated, the possibilities of increased food production are very large. Irrigation schemes on a vast scale are already in operation, and in conjunction with well-developed means of transport have not only mitigated the famines due to crop failures, but also done much to increase the exportable surplus of food and raw materials of vegetable origin. The next advance in this direction will be the construction of the Lloyd Barrage across the Indus near Sukkur. When this and the connected works are completed, some eight million acres of partly desert land will gradually be brought under cultivation—*i.e.*, an area exceeding by 2½ million acres the whole of that available for agricultural and allied purposes in Egypt.

Considering that Indian agriculture is well organized, that agricultural education is provided for, and that important research is being conducted with activity and efficiency, there can be no doubt that the gradual adoption of improved methods will ultimately largely increase the yield per acre in the case of many crops, among which sugar cane may be particularly mentioned. The poverty, conservatism, and lack of education of the agricultural population are the chief obstacles in the way of such advances, so that progress by way of more intensive production must be of necessity extremely slow. But a great deal will doubtless be effected, in spite of these difficulties, by the adoption of improved varieties, the constant combating of insect and fungoid pests, and similar measures.

It is, however, necessary to emphasize the fact that the vast population of India consumes the bulk of the food crops that are produced, and only a small percentage of a given yield is available for export. The actual average figures, pre-war and 1921-22, are as follows: rice, 9 and 4; wheat, 14 and 1; sugar, 0·4 and 0·2. The percentages are much higher for cotton and oil-seeds, which are given here, because edible oils and oilcakes come within the scope of this volume: cotton, 56 and 67; linseed, 73 and 40; rape and mustard, 23 and 11; sesamum, 25 and 6; ground nuts, 35 and 25.

The production and distribution of fruit are receiving attention, largely owing to the activities of the Fruit Experiment Station at Quetta, and canning is carried out at several centres. Baluchistan may be mentioned as an example of resources capable of large development.

"The upland valleys of Baluchistan might become the California of India. The Agency is one of the most favourable localities in India for the growing of fruit. The climatic conditions are almost ideal. There is a cold winter which

gives the necessary resting period for those deciduous fruit trees which are characteristic of the temperate regions, while the hot, dry summer months afford excellent conditions for ripening. Rain rarely falls in summer, and so the fruit is sound and well suited for transport. Moreover, the dry atmosphere prevents the development of fungoid pests which afflict the fruit grower in damper regions " (*Bulletin No.* 9, Fruit Experiment Station, Quetta, 1918, p. 1).

2. The UNION OF SOUTH AFRICA, for its further development, needs migrants possessing a cretain amount of capital—£2,000 at the very least—who are desirous of taking up the occupation of land after acquiring—in the Dominion—the necessary practical knowledge, including the methods of organizing and controlling native labour. Our race has always shown itself eminently adapted to such enterprises, for which a large field is also open in RHODESIA and the healthier parts of the KENYA COLONY and the TANGANYIKA TERRITORY. One source for the supply of migrants of this kind is provided by the public schools of the home country, and the voluntary work of the Public Schools Employment Bureau (Hon. Sec., W. A. Bulkeley-Evans, 5, Paper Buildings, Temple, E.C.), has included for some years the promotion of migration to all parts of the Empire.

It is eminently desirable that educational institutions of all grades and kinds in the United Kingdom should impart to those under instruction an accurate knowledge of the nature and needs of the Empire, of what life in the various Dominions and Colonies actually means, and of the chief possibilities open to intending migrants. It is true that some attention has already been paid to this vitally important matter, but much remains to be done, and the publicity departments of High Commissioners and Agents-General are not only willing, but anxious to co-operate. The British Empire Exhibition affords a unique opportunity of furthering and stimulating educational propaganda in the direction indicated. The cinematograph is undoubtedly one of the most powerful educational instruments for bringing home to an audience the nature of Empire life in all parts of the globe, and an increasing number of instructive films are available.

As already stated, the possibilities of increased food production in the Union are immense, and much can also be done in the Kenya Colony and the Tanganyika Territory. The area of cultivated land in the Union has been largely extended by the methods of dry farming and by irrigation, and the Department controlling the latter has been responsible for large expenditure. The area of irrigated land amounted to 817,862 acres in 1921, and it was then estimated that over 572,000 additional acres were irrigable.

The Department of Agriculture is divided into eighteen subdepartments, and the following list of some of the matters dealt with (quoted from the *Official Year Book*, No. 5, for 1922) will give an idea of the various activities for improving and increasing the production of food of vegetable origin: " Inspection of . . . grain and other agricultural produce for export. Control of the sale of fertilizers . . . seeds and pest remedies. Improvement of pastures. Growing of cereals and fodder plants. Control of plant diseases and insect pests. Agricultural chemistry. Viticulture. Horticulture. Collection and distribution of guano. Dry farming. Agricultural co-operation. Circulation of publications on agriculture. Crop estimates. Agricultural education. Agricultural extension work.

Agricultural experiments. Irrigation. Conservation of water. Water-boring. Meteorology."

It is particularly interesting to learn that, after many struggles, agricultural co-operation has been well established, and its future would appear to be assured: "There has recently been a great development of the co-operative movement in every province of the Union, and farmers of all kinds are keenly interesting themselves in the organization of co-operative marketing associations. To meet the demands of the times, a new Co-operation Act to regulate the constitution of Co-operative Agricultural Societies and Companies throughout the Union was passed during the 1922 session. This *Co-operative Societies Act* (Act No. 28 of 1922) provides for the appointment of a Registrar of Co-operative Societies, and for the formation and registration of agricultural co-operative societies with unlimited, and agricultural co-operative companies with limited, liability. The principal objects for which these societies and companies may be formed are (i.) to arrange the sale of produce and the purchase of agricultural requisites in the most profitable manner; (ii.) to recruit and supply labourers; and (iii.) to carry on the business of banking and insurance under a co-operative system" (1922 *Year Book*, p. 549).

There are some 400 Agricultural Societies and Farmers' Associations in the Union, for the most part affiliated to one or other of the four Agricultural Unions which have been established for the Cape Province, Natal, the Orange Free State, and the Transvaal, respectively. There are also a number of important bodies by which the interests of various branches of the land industry are furthered, such as: The Nurserymen's and Seedmen's Association of South Africa; The Co-operative Wine Farmers' Association of South Africa; The South African Sugar Association; The South African Maize Breeders, Growers, and Judges' Association; and The South African Fruit Growers' Exchange.

Extensions and improvements of facilities for transport have been carried out on a large scale during the last few years. For the period extending from 1910, when the union was established, to 1921, the railways have been extended by 2,550 miles at a cost of £9,677,737. The road mileage in 1915-16 was 47,372, the number of bridges 536, and the expenditure £389,827; the corresponding figures for 1920-21 were 60,374,611, and £1,266,228. With the object of discovering a new outlet for the Transvaal coal trade "The Union Government instituted in 1922 an investigation into the possibilities of developing a new outlet on its eastern seaboard through northern Zululand, a very rich but little-known area of South Africa. . . . An inspection of prospective connecting routes . . . revealed the fact that very economical railways with easy gradients could be constructed to serve a new harbour on the Zululand coast with the added advantage that more than a million acres of Crown lands, rich in general agricultural prospects and highly suited to the production of cotton and sugar cane, would be opened up to settlement" (1922 *Year Book*, p. 758).

The rapid transmission of information is only second in commercial importance to the speedy transport of commodities, and the Union of South Africa is forging a new link of Empire in its interests: "In September, 1922, the Union Government entered into an agreement with the Marconi's Wireless

Telegraph Company, Ltd. (England), for the erection of a high-power wireless station capable of direct communication with the United Kingdom" (1922 *Year Book*, p. 811).

The development of RHODESIA, the KENYA COLONY, and the TANGANYIKA TERRITORY is largely bound up with the question of communications and convenient outlets for export. The two latter have their own share in the coast-line, but Rhodesia is separated from the sea by Portuguese East Africa, the nearest seaport being Beira, and it is a fortunate circumstance that this is in the possession of a friendly power. The initial capital required by migrants for the three parts of the Empire in question is somewhat larger than for the Union of South Africa, and £2,500 is considered bedrock for Southern Rhodesia.

As regards the possibilities by way of the increased production of food of vegetable nature in the parts of Africa under consideration, the outstanding points have received notice in Section II. For the Union, maize and other cereals, fruit, sugar cane, and wine are of most importance; while cereals and citrus fruit have good prospects in Southern Rhodesia, and later on the former may swell the exports of the Kenya Colony. The Tanganyika Territory even now exports a small amount of grain, and this is likely to increase when economic conditions improve, though at the present time the depression of trade is acutely felt.

Industrialization is making steady progress in certain parts of the Union of South Africa, and numerous factories are concerned with working up vegetable products, as may be seen from the following figures for 1920-21:

	Number.	*Value of Materials.*	*Value of Output.*
		£	£
Bakeries, bread and biscuit factories ..	333	3,350,858	4,669,837
Breweries (including native beer breweries and malt works)	90	800,948	2,060,754
Grain mills	705	11,032,134	12,133,426
Jam factories, fruit-preserving works, and sweet factories	71	1,306,752	1,816,320

A few figures from the Statistical Summary of Progress (1922 *Year Book*, p. 1053) will also be of interest:

		1904.	1911.	1921.
Agricultural production:				
Maize	Tons	452,967	863,252	1,334,724
Kaffir corn	,,	136,793	154,773	155,405
Wheat	,,	70,865	181,032	228,401
Oats	,,	65,356	154,569	95,617
Barley	,,	24,258	30,573	28,535
Potatoes	,,	82,207	92,119	112,013
Wine	1,000 Gals.	5,687	7,501	16,945
Total imports (including specie)	£1,000	32,476	36,925	57,800
Total exports (excluding specie)	£1,000	29,744	57,024	74,354
Maize exported	Tons	8,102	103,277	388,623
Vessels entered	Number	—	1,805	1,217
	Tonnage	—	5,417,444	4,198,683
Vessels cleared	Number	—	1,803	1,204
	Tonnage	—	5,439,166	4,177,959

3. Other Parts of the Empire with Mainly Native Population.—The most important of these in respect of vegetable food production are the British West Indies and British Guiana. We are here mainly concerned with fruit and sugar cane. Considerable development of the fruit industry is possible, but the future of cane sugar, which vitally affects the future of all the cane-growing parts of the Empire, depends on a number of factors, among which fiscal policy is of the most importance. Taking a long series of years, say from 1840, it will be found that the world consumption of sugar doubles every twenty years. It was first satisfied by cane sugar, but the rise of the beet sugar industry resulted in its gradual replacement by beet sugar to an increasing extent, until this came to occupy first place. According to the Board of Trade returns the United Kingdom imported 1,948,264 tons of sugar in 1913, this consisting of: raw cane, 395,672; refined cane, 670; raw beet, 645,970; refined beet, 905,952. Owing to the disorganization of the European beet sugar industry as a result of the War, cane sugar has resumed, for the present, its former dominance, placing the British West Indies and British Guiana in a much stronger position, though Cuba is far ahead of every other country as regards the total output. Nevertheless, sugar remains dear, for there is still a shortage, and the check on the industry caused by the War will continue to make itself felt for a considerable period. The world production for 1922-23 was estimated by Willett and Gray, in July, 1923, at 18,257,441 tons, made up of 13,118,401 cane and 5,139,040 beet.

The attraction of enough capital to make the Empire self-supporting as regards sugar will entirely depend upon whether the cultivation of sugar cane is secured against foreign competition for a considerable number of years. Capital is necessary, not merely for increasing the area of cultivation, but also to enable the most up-to-date methods of increasing yield and dealing with the crop.

Little need be said here about increasing food production in such parts of the Empire as the West African Colonies and Territories, Uganda, British Malaya, the Bornean Colonies, and the Pacific Islands. Their most important vegetable products are nuts and seeds furnishing raw materials for oil extraction, though here it is true that some of the oils are used as food, and that the residues are employed for stock-feeding; cotton, sisal, and other fibres; rubber; tobacco, tea, coffee, and cacao; and spices. All these are dealt with in other volumes in this Series. There is, however, the question of tropical fruits, such as bananas and pineapples, where increased production is in many cases possible. It may also be remarked that we rely almost entirely upon foreign countries for our supply of dates. In one part of the Empire, the Sudan, the date palm is indigenous, but the fruit, for the most part, is consumed locally. The production of an exportable surplus on a considerable scale would appear to be within the bounds of possibility, though at present it is not a commercial proposition.

Even, however, in Colonies or Territories where, from the nature of the case, the production of food for export is impossible, or would interfere with the more important business of securing an increased output of some kind of raw material, it would be desirable to reduce the dependence on imported food by increasing production for local consumption. The point has already been

raised in regard to the Tanganyika Territory (p. 79), and many other instances might be adduced. Ceylon, for instance, imports a considerable amount of rice from India, and suffers should there be a failure in the crop there. In fact, every part of the Empire has its own food problems, and in all cases the import of one kind of food or other may be necessary; but, other things being equal, the sound policy is to draw upon Imperial food resources in preference to relying on the products of foreign countries. In order to prevent repetition it will be convenient to postpone further consideration of other general questions to the end of the next volume, after a review has been presented of Empire resources with regard to food of animal origin. For it is obviously desirable to deal with food as a whole, whatever may be the industry by which it is rendered available—agriculture, horticulture, the pastoral side of production, or fisheries.

1931

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VOLUME I., PART I.

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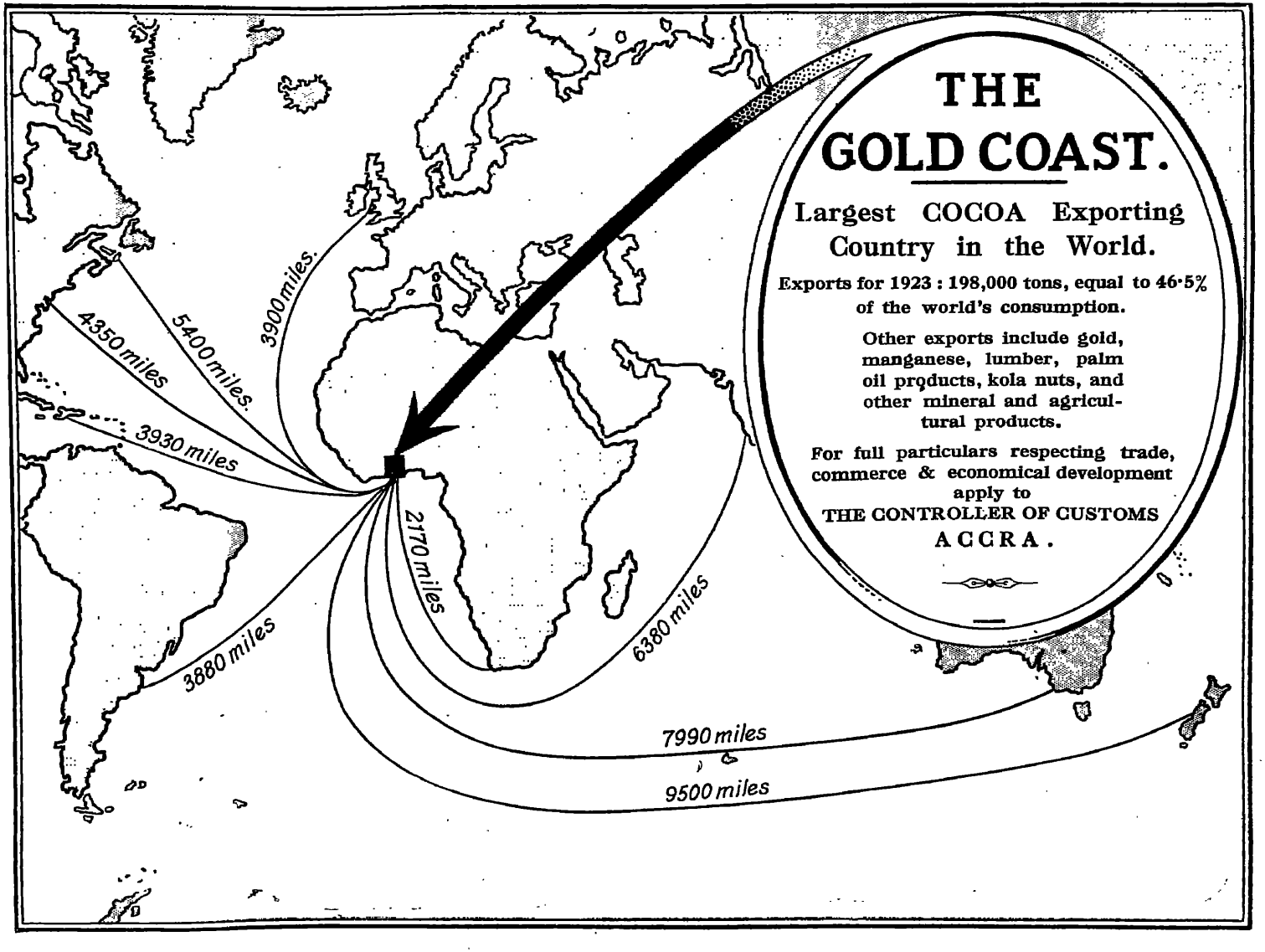
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Rice Flour.—Exports amounted to 159·4 tons (£1,405) in 1913-14, and 35 tons (£680) in 1921-22.

6. MILLET.—Several important grain crops come under this heading, particularly *jowar*, great millet (*Sorghum vulgare*), and *bajra*, bulrush or spiked millet (*Pennisetum typhoideum*). The former is the staple food of the agricultural population of the Madras and Bombay Deccan, and the adjacent parts of Hyderabad, while the straw is used as fodder. It is also largely cultivated in the Central and United Provinces, and to some extent in Burma.

Imports of jowar and bajra: 1913-14, 17·9 tons (£113); 1921-22, 4,064 tons (£74,694). Exports: 1913-14, 84,294·2 tons (£576,164); 1921-22, 4,679 tons (£77,343).

7. OTHER GRAIN.—Imports: 1913-14, 33·4 tons (£210); 1921-22, 945 tons (£11,821). Exports, 1913-14, 332·6 tons (£2,182); 1921-22, 5,207 tons (£81,262).

	Jowar.		*Bajra.*	
	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Acreage (Thousands).*	*Total Yield (Thousands of Tons).*
1913–14	21,405	4,044	14,808	1,986
1921–22	28,437	4,956	12,691	1,815

II. AND III.—PULSE CROPS.

A large variety of pulses are grown in India, but statistics of acreage and yield are not available except in the case of gram. They are for the most part consumed locally, so that the export is relatively inconsiderable. In 1913-14 the amount shipped was 114,628 tons (£711,009) and in 1921-22, 75,422 (£824,810).

1. GRAM.—This leguminous plant (*Cicer arietinum*) takes first place among the pulse crops, about half the acreage being in the United Provinces, and most of the other half in Bengal, Bombay, and the Central Provinces. The horse-gram (*Dolichus biflorus*) is an entirely different species, extensively cultivated in South India, where it takes the place of oats.

	Acreage (Thousands).	*Total Yield (Thousands of Tons).*	*Exports (Tons).*
1913–14	8,958	1,938	69,597 (£415,104)
1921–22	14,630	4,335·4	4,938 (107,824)

2. OTHER PULSES.—These include peas and beans of various kinds, lentils (*masur*), pigeon-peas (*arhar*), etc. The Burma white bean (*pebugale*) is of considerable importance as cattle-food, and also for human consumption. The

term " dhal " is applied to split pleas, beans, and other pulses, the commonest forms prepared in this way being the ordinary edible pea (*Pisum sativum*) and the mungo bean (*Phaseolus mungo*), a species allied to the white bean of Burma (*P. lunatus*).

Imports: 1913-14, 1,222·8 tons (£9,586); 1921-22, 1,353 tons (£25,033). Exports: 1913-14, 114,628·2 tons (£711,009); 1921-22, 75,422 tons (£1,237,215).

IV. AND V.—GRASS AND FORAGE CROPS.

India possesses a very large area of natural pasture, and forage crops, including cereals, are grown on a considerable scale. It is impossible to give even the approximate acreage as detailed statistics are not available.

VI.—SUGAR CROPS.

SUGAR CANE:

	Acreage (Thousands).	*Total Yield (Thousands of (Tons Raw Sugar).*	*Yield per Acre (Pounds Raw Sugar).*
1913–14	2,537	2,297·5	2,029
1921–22	2,382	2,590	2,436

Although the area under cane is larger than in any other country, the yield per acre is low, and the local demand is so great that cheap foreign sugar is imported on an increasingly large scale. The application of modern methods would greatly enlarge the yield.

Cane Sugar.—Imports (mostly foreign): 1913-14, 802,978·3 tons (£9,525,678); 1921-22, 717,642 tons (£26,778,825).

Confectionery.—1913-14, 3,669·5 tons (£175,550); 1921-22, 648 tons (£187,536).

Exports (including confectionery): 1913-14, 9,596 tons (£91,649); 1921-22, 6201 tons (£248,669).

Sugar is chiefly exported in the form of crude molasses (*gur*) to Ceylon, the Straits Settlements, and Fiji, where it is consumed by the Indian population in preference to the ordinary form.

Molasses.—Imports amounted to 90,202·1 tons (£260,197) in 1913-14, and 64,357 tons (£494,747) in 1921-22.

VII.—FRUIT.

Although India produces a great variety of fruits these are mostly consumed locally, and are augmented by imports, as will be gathered from the following figures.

1. FRESH FRUIT:

	Imports (Value).	*Exports (Value).*
1913–14	£24,401	£5,349
1921–22	£25,483	£13,489

2. DRIED AND PRESERVED FRUITS:

	Imports (Tons).	*Exports (Tons).*
1913–14: Currants and raisins	842 (£14,633)	—
1921–22: „ „	957 (£37,135)	—
1913–14: Dates	45,921·8 (£401,411)	—
1921–22: „	49,560 (£1,008,398)	—
1913–14: Other preserved fruits.. ..	2,432·3 (£42,753)	—
1921–22: „ „ „	2,003 (£76,561)	9,489 (£192,614) (Dried, salted, and preserved fruit and vegetables)

3. CANNED AND BOTTLED FRUITS.—Imports amounted to 6,494·5 tons (£377,943) in 1913-14; and 538·0 tons (£66,471) in 1921-22.

4. JAMS AND JELLIES.—Imports, 936 tons (£46,423) in 1913-14; 553·2 tons (£84,195) in 1921-22.

VIII.—EDIBLE NUTS.

1. ALMONDS.—Imports, 2,855·1 tons (£162,593) in 1913-14; 5,231 tons (£464,019) in 1921-22.

2. COCONUTS (number).—Imports, 9,280,771 (£32,413) in 1913-14; 7,315,033 (£75,526) in 1921-22. Exports, 344,111 (£1,517) in 1913-14; 452,755 (£4,378) in 1921-22.

IX.—VEGETABLES.

1 FRESH:

	Imports (Value).	*Exports (Value).*
1913–14	£73,019	£192,766
1921–22	£10,906	£348,911

2. OTHER KINDS.—Exports, 1921-22, £72,932. Also some included with Dried Fruit, etc., see above.

X.—MISCELLANEOUS.

	Imports.		*Exports.*	
	1913–14 (*Tons and £*).	1921–22 (*Tons and £*).	1913–14 (*Tons and £*).	1921–22 (*Tons and £*).
Biscuits and cakes ..	4,171·9 (£298,732)	696·1 (£183,628)	— —	— —
Various farinaceous foods	14,914·6 (£318,329)	13,688·6 (£597,812)	— —	— —
Fodder	3,812·7 (£16,241)	1145·9 (£8,025)	7,702·5 (£37,289)	8,456·5 (£63,967)
Oilcake	84·9 (£533)	176·0 (£1,887)	175,313·6 (£920,249)	112,928 (£1,365,673)

XI.—Potable Alcohol (and Vinegar).

1. Spirits.—Imports (in gallons) as follows:

	Brandy.	*Whisky.*	*Gin.*	*Rum.*	*Other Spirits.*	*Liqueurs.*
1913–14 ..	400,692 (£212,796)	709,028 (£311,712)	86,595 (£26,267	74,279 (£9,922)	81,185 (£32,450)	16,330 (£19,732)
1921–22 ..	247,712 (£492,744)	590,213 (£1,236,599)	61,473 (£90,283)	160,395 (£38,996)	141,807 (£102,397)	13,410 (£38,806)

(As Government stores 7,179 gallons of spirits were imported in 1913-14 and 286,381 in 1921-22.)

2. Malt Liquors:

Hops.—Imports, 54·5 tons (£9,529) in 1913-14; and 159·6 tons (£42,602) in 1921-22.

Ale, Beer, and Porter.—Imports, 4,625,880 gallons (£439,385) in 1913-14; and 2,756,309 gallons (£979,046) in 1921-22.

3. Cider and Perry.—26,399 gallons (£5,282) were imported in 1913-14; and 10,943 (£8,341) in 1921-22.

4. Wine.—338,188 gallons (£194,096) were imported in 1913-14; and 248,648 (£384,789) in 1921-22.

(As Government stores 410 gallons were imported in 1913-14, and 643 in 1921-22).

5. Vinegar.—Imports (in bulk): 176·5 tons (£2,551) in 1913-14; 1168·1 tons (£4,329) in 1921-22.

CEYLON

Area, including that of the attached islands, 25,481 square miles; population (1921), 4,504,549 (8,937 Europeans). Agriculture is the staple industry, and about one-quarter of the area is under cultivation.

	1913.		1921.	
	Acreage.	*Total Yield.*	*Acreage.*	*Total Yield.*
Rice	671,711		850,409	13,657,797 bushels
Millet	—		105,722	—
Other grain	112,600		118,573	4,305,838 ,,
Coconuts	948,374		820,001	958,667,739 (number)
Tubers	—		1,432	—
Vegetables	—		29,820	—

CHIEF IMPORTS.

		1913.	1921.
Grain and pulse:			
Paddy and rice	Tons	402,987	338,345
	£	3,468,058	4,851,379
Other, including flour	£	326,944	577,865
Sugar: raw and refined ..	Tons	26,913	22,609 tons
	£	361,938	£731,758
Sugar: palm and jaggery ..	Tons	1,352	
	£	9,014	
Potatoes	Tons	9,210	4,769
	£	72,268	78,616
Onions	Tons	15,185	15,738
	£	60,806	146,840
Spirits	£	124,139	141,545
Wine	£	25,860	24,094

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Coconuts	Thousands	16,861	23,739
	£	92,757	157,466
,, desiccated	Tons	15,190	43,526
	£	524,448	1,773,493

BRITISH MALAYA

The area of this extensive territory is 53,960 square miles, and the total population in 1921 was 3,358,054 (Europeans, 14,954). The geographical position of the Malayan ports makes them of great importance in inter-Empire trade. British Malaya is divided into three administrative sections: (1) The Straits Settlements, (2) The Federated Malay States, (3) The Non-Federated Malay States (including the protected State of Johore).

The chief vegetable food products are rice, tapioca, sago, and certain fruits, such as pineapples, but Malayan resources are comparatively undeveloped in this direction, the rubber and mineral industries being at present the most important.

1. THE STRAITS SETTLEMENTS.

These include (*a*) Singapore, (*b*) Penang, (*c*) Malacca, (*d*) Cocos-Keeling Islands, (*e*) Christmas Island, and (*f*) Labuan. Area, 1,600 square miles; population (1921), 883,769.

(*a*) SINGAPORE (area, 217 square miles; population, 418,358) is highly fertile and productive, and the most important commercial emporium in South-East Asia, besides being of great strategical value. As a port of call it is an indispensable link between the trade of Europe and India, and that of the Far East and Australasia. During 1921 the number of merchant vessels entered and cleared was 11,384, with a tonnage of 1,794,356. This does not include native craft. The trade returns for that year amounted to £6,661,709.

(*b*) PENANG includes the island of that name, Province Wellesley on the mainland, and the Dindings. Penang itself has an area of 108 square miles, and a population (1921) of 162,144. It is an important emporium, and the total trade for 1921 amounted to £4,086,790.

Province Wellesley (area, 288 square miles; population, 130,341) is well cultivated, comparatively speaking. The Dindings consists of a strip of mainland and a group of islands (area, 183 square miles; population, 11,850), and possesses the best port on the west side of the Malay Peninsula.

(*c*) MALACCA has an area of 720 square miles, and a population (1921) of 153,522. Its total trade in 1921 amounted to £2,627,296.

(*d*) THE COCOS-KEELING ISLANDS (population 863) constitute an important link in Empire communication, for they possess a station of the Eastern Extension Telegraph Company. Copra is exported to some extent.

(*e*) CHRISTMAS ISLAND (area, 56 square miles; population, 783) is of agricultural value on account of its extensive phosphate deposits.

(*f*) LABUAN.—Area, about 28 square miles; population (1921), 5,908. Rice and sago are among the exports.

CHIEF IMPORTS.

		1913.	1921.
Padi and rice	£	6,920,934	7,184,397
Beans and Peas	£	268,150	377,821
Flour, wheat	Tons	38,914	28,086
	£	458,350	659,731
Bran	£	321,395	537,050
Sago	Tons	50,509	37,788
	£	314,903	344,870
Sugar	Tons	99,181	84,526
	£	1,237,154	2,143,743
Provisions	£	264,152	300,408
Vegetables, preserved	£	223,769	283,673
Beer and ale	£	255,260	132,818
Spirits	£	401,135	579,699

CHIEF EXPORTS.

		1913.	1921.
Padi and rice	£	5,542,233	5,561,391
Beans and peas	£	163,971	242,034
Sago	Tons	59,956	40,339
	£	454,192	430,324
Tapioca	Tons	38,080	41,112
	£	448,920	535,123
Sugar	Tons	58,189	47,586
	£	715,480	1,279,922
Pineapples, preserved	£	365,479	724,545

2. THE FEDERATED MALAY STATES.

Area, 27,648 square miles; population (1921), 1,324,890. They include the most fertile States of the peninsula—*i.e.*, Perak, Selangor, Negri Sembilan, and Pahang, highly important sources of Empire raw material. The agricultural industry requires development, and the possibilities are great.

CHIEF IMPORTS.

		1913.	1921.
Grain and flour:			
Bran	Tons	24,068	24,160
	£	97,020	121,151
Rice	Tons	200,649	109,664
	£	2,214,681	1,930,642
Wheat flour	Tons	11,908	7,917
	£	133,704	190,945
Other	£	148,965	238,072
Sugar	Tons	14,924	9,450
	£	182,034	262,167
Vegetables, fresh and preserved	£	109,590	102,436
Provisions	£	134,719	169,812
Malt liquors	Gallons	1,425,411	159,793
	£	195,814	51,095
Spirits	£	205,441	181,479

CHIEF EXPORTS.

		1913.	1921.
Grain:			
Padi	Tons	18,695	1,733
	£	73,292	10,111
Rice	Tons	405	6,329
	£	3,467	153,079

3. THE NON-FEDERATED MALAY STATES.

These include the States of Kedah, Perlis, Kelantan, and Trengganu, with the Protected State of Johore. Area, 24,970 square miles; population (1921), 1,114,263. Practically all the trade is with the Straits Settlements.

JOHORE: CHIEF IMPORTS.

		1914.	1921.
Grain, etc.:			
Bran	Tons	3,959	5,938
	£	14,645	38,758
Rice and padi	Tons	26,230	48,869
	£	235,972	674,258
Wheat flour	Tons	922	210
	£	11,185	52,732
Sugar	Tons	1,813	2,421
	£	23,949	82,193
Spirits	£	38,006	93,523

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1914.	1921.
Tapioca	Tons	3,636	6,677
	£	32,083	110,843

KELANTAN: CHIEF IMPORTS.

		1913.	1921.
Grain and flour	£	46,000	18,441

CHIEF EXPORTS.

		1913.	1921.
Fish, dried or salted	Tons	1,054	1,062
	£	16,597	30,044

TRENGGANU: CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	5,436	335
	£	51,047	5,498
Sugar	Tons	562	107
	£	6,607	3,375

CHIEF EXPORTS.

		1913.	1921.
Padi	Tons	5,391	—
	£	25,899	—

BRITISH NORTH BORNEO

Area, 31,000 square miles; population, 258,355, mostly of Asiatic coast settlers and natives in the interior. There is considerable export of various tropical products, and extensive development in the cultivation of sugar cane, cassava, etc., is possible, large tracts being suitable for the purpose.

CHIEF IMPORTS.

		1913.	1921.
Padi, rice, and flour ..	Tons	15,252	12,290
	£	133,495	194,697
Sugar	Tons	1,074	1,075
	£	14,054	31,494
Provisions	£	48,470	75,087
Spirits and wine	£	20,184	35,747

CHIEF EXPORTS.

		1913.	1921.
Sago flour	Tons	4,299	1,135
	£	19,960	8,370

BRUNEI

This native State in the north-west of Borneo has an area of about 4,000 square miles, and a population (1921) of 25,454, mostly Malays and Borneans.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	—	886
	£	9,691	18,593
Flour	£	—	1,408
Sugar	Tons	—	110
	£	2,298	3,511
Provisions	£	—	1,753

CHIEF EXPORTS.

		1915.	1921.
Sago	£	4,343	5,106

SARAWAK

This State occupies part of North-West Borneo, and has an area of about 42,000 square miles. Population estimated at 600,000. The food-products include rice and sago, and the country is capable of considerable development.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	11,645	6,253
	£	111,427	90,485
Flour	£	7,544	13,539
Sugar	Tons	1,347	1,005
	£	17,038	28,956

CHIEF EXPORTS.

		1913.	1921.
Sago flour	Tons	15,929	17,956
	£	119,071	169,809

HONG KONG

This Crown Colony consists of Hong Kong and some smaller islands, together with British Kowloon and the New Territories on the mainland. Total area, 391 square miles, and population (1921), 662,200. The colony is a vitally important outpost of Empire, and holds a leading position as an emporium. The number of merchant ships entered and cleared in 1921 was 18,011, with a total tonnage of 24,165,153 (not including native craft). The total trade for 1921 amounted to £167,613,388.

The arable land is of very limited extent, but small amounts of rice and vegetables are raised for local consumption. There is a large area in the New Territories which is cultivated by the natives, the chief products being rice, sugar, vegetables, pineapples, and other fruits.

WEIHAIWEI

The area of this territory is about 285 square miles, and the population (1921), 48,000. Agriculture is the chief industry, but the food produced is for local consumption. The acreage occupies approximately two-fifths of the total area.

Chief imports, 1921: Flour, 49,159 bags (£17,204); rice, 30,693 bags (£34,684); maize, 53,004 bags (£18,552); millet, 7,281 bags (£3,398); sugar, 34,069 bags (£59,596); beans, 8,865 bags (£3,620); bean cakes, 43,801 pieces (£10,486); bean oil, 25,590 tins (£29,855); provisions, 1,977 cases (£9,014); wine, 2,599 cases (£6,064). Chief exports, 1921: Bean cakes, 9,429 pieces (£2,200); bean oil, 995 barrels (£1,160); bean paste, 1,954 tins (£1,140); sugar, 16,870 bags (£29,491).

AFRICA

EGYPT

The kingdom of Egypt, as already remarked, is included in the scope of this Series because it has been so intimately bound up with the trade of the British Empire, of which it was a part for a very short time. There are still close ties of a financial as well as a commercial nature, and in all probability the interchange of commodities in the future will be on a more considerable scale than in the past.

The area of the kingdom is about 363,181 square miles, and the population (1917), 12,718,255.

Egypt is primarily an agricultural country, cultivation, however, being only possible within the area covered by soil consisting of Nile alluvium, and formerly only in that part of it naturally watered by the annual overflow of the river. The introduction, by stages, of scientific irrigation, which began in the latter part of last century, has greatly increased the cultivated area and effected a revolution in the practice of Egyptian agriculture, mostly in Lower Egypt. The total area of alluvial soil is about 8,450,000 acres, of which 5,400,000 acres are now under cultivation, and it may ultimately be possible to increase this to 7,600,000.

The chief agricultural crops are wheat, barley, maize, rice, and other cereals; beans, lentils, and other pulses; clover, important for maintaining the fertility of the soil; and sugar cane. Fruits, of which dates are by far the most important, and vegetables are also among the plant products. Egypt already produces a considerable surplus of exportable food, and from what has just been said it will be gathered that the possibilities of increased production are very considerable.

CHIEF IMPORTS.

		1913.	1921.
Wheat	Tons	4,513	41,968
	£	40,457	1,357,224
Rice	Tons	53,456	27,246
	£	576,617	471,552
Flour (wheat and maize)	Tons	200,341	226,749
	£	2,253,575	7,360,217
Sugar	Tons	32,417	8,088
	£	389,383	270,556
Wine	Tons	8,896	7,811
	Dozen bottles	30,033	38,368
	£	141,904	286,040

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Wheat	Tons	2,277	27,635
	£	20,988	208,713
Maize	Tons	242	10,214
	£	1,730	82,417
Rice	Tons	23,175	18,878
	£	286,184	494,606
Beans, dried	Tons	1,190	8,303
	£	10,553	86,654
Sugar	Tons	5,052	7,354
	£	81,127	321,193
Onions	Tons	100,810	65,252
	£	282,664	366,920
Cotton-seed cake	Tons	61,965	91,922
	£	303,499	602,000

THE SUDAN

This very extensive territory, with an area of 1,914,600 square miles, is as large as British India and two-thirds the size of China. The estimated population is about 4 millions, including some 3,000 Europeans. The pastoral industry is the one of most importance, but there are enormous possibilities in the direction of cotton-growing, and it is expected that these will be largely developed in the immediate future. The chief vegetable products exported are millet and dates.

CHIEF IMPORTS.

		1913.	1921.
Grain:			
Durra	Tons	7,627	40
	£	59,622	281
Rice	Tons	2,505	2,631
	£	25,701	37,238
Wheat	Tons	1,700	2,317
	£	16,062	54,953
Flour: wheat	Tons	7,779	6,260
	£	88,412	142,945
Sugar, refined	Tons	15,813	6,623
	£	265,488	424,548
Spirits and liqueurs ..	£	29,786	61,885

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Grain:			
Durra	Tons	2,047	30,672
	£	22,282	239,358
Dukhu..	Tons	7	6,934
	£	82	58,358
Beans: dried	Tons	3,756	857
	£	1,644	16,633
Dates	Tons	2,741	3,424
	£	32,702	88,307

GAMBIA

This includes a Crown Colony and a Protectorate. Total area, 4,132 square miles; population (1921), Colony, 9,227; Protectorate, 201,303. The food-crops are insufficient for local consumption and are supplemented by imports. The chief vegetable exports are ground nuts, and to a much less extent palm kernels, as raw material for the oil industry.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	5,476	2,984
	£	62,512	56,720
Flour	£	7,443	15,115
Bread	Tons	419	—
	£	8,521	—
Sugar	Tons	960	94
	£	19,422	4,545
Provisions	£	13,094	13,895

SIERRA LEONE

The area of the colony is about 4,000 square miles; population (1921), 85,163 (1,161 Europeans). The area of the Protectorate is estimated at 27,000 square miles, and the population at 1,456,168. The staple crops are rice, millet, maize, and cassava, and there is some export of grain.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	593	107
	£	8,660	3,428
Flour	Tons	1,526	883
	£	23,772	38,877
Bread or biscuits	£	10,055	6,975
Sugar: refined	Tons	624	309
	£	12,012	18,236
Provisions	£	39,982	34,584
Ale and beer	£	13,457	22,869
Gin and Geneva	Gallons	409,493	336
	£	56,239	215
Rum	Gallons	174,850	8,232
	£	15,757	9,919
Whisky	Gallons	26,533	9,743
	£	11,218	13,180
Other spirits	£	8,832	13,792

GOLD COAST

Here are included the Gold Coast Colony and the Protectorates of Ashanti and the Northern Territories, the total area being 80,235 square miles, and the total population (1921) 1,503,386 (about 1,000 Europeans). The chief food-product exported is cocoa, dealt with in Volume IV. of this Series. Attempts are being made to promote the cultivation of rice.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	7,982	3,222
	£	111,233	93,471
Flour	Barrels	53,824	3,147 tons
	£	79,575	159,088
Sugar	Tons	2,949	805
	£	56,614	43,276
Provisions	£	239,624	263,675
Ale, beer, cider, and perry	Gallons	148,742	118,492
	£	22,034	44,266
Gin and Geneva	Gallons	558,868	83,855
	£	84,367	64,307
Rum	Gallons	1,153,456	14,781
	£	100,093	15,563
Whisky	Gallons	45,756	177,519
	£	25,733	228,555
Wine	Gallons	70,911	58,181
	£	21,485	37,166

NIGERIA

The total area of the Colony and Protectorate is 336,000 square miles, and the estimated population is about 16½ millions. Various cereals and tropical root crops are grown, but up to the present the colony has been mainly developed for the supply of raw materials to the oil industry, and in regard to tin-mining.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	8,791	2,011
	£	98,033	57,217
Flour	Tons	2,771	1,267
	£	26,909	61,431
Bread and biscuits	£	52,472	49,556
Provisions	£	168,883	157,239
Gin and Geneva	Gallons	3,972,258	110,755
	£	383,064	86,877
Whisky	Gallons	100,825	73,214
	£	31,726	98,556

ST. HELENA

Area, 47 square miles; population (1921), 3,747. The island is of little importance as regards food production.

CHIEF IMPORTS.

		1913.	1921.
Rice	£	2,609	3,113
Flour	£	3,004	14,375
Sugar	£	2,038	7,041
Oilman's stores	£	7,852	10,327
Beer	£	671	1,198
Spirits	Gallons	1,951	1,305
	£	793	1,361

ASCENSION

Area, about 34 square miles; population, 250. The produce is small, and supplemented by imports.

UNION OF SOUTH AFRICA

The Union proper (Cape of Good Hope, Natal, Transvaal, and Orange Free State) and the South-West Protectorate, taken together, have an area of 795,289 square miles, with a total population (1921) of 7,156,319, of which the whites number 1,538,920. Associated with these are the areas administered by the South African High Commission: Basutoland, 11,716 square miles, population 498,781 (1,603 whites); Bechuanaland Protectorate, 275,000 square miles, population 152,983 (1,743); and Swaziland, 6,678 square miles, population 112,951 (2,205 whites).

THE UNION PROPER

Within the area of the Union there a great variety of climatic conditions and soils, and a corresponding variety of plant products, ranging from tropical fruits to the crops characteristic of temperate countries. The comparatively unindented coast-line of only 1,854 miles is a drawback from the standpoint of trade, for it contributes to transport difficulties. But with extension of inland communications the possibilities of development are rapidly increasing, and there is scarcely any limit to what might be done by way of food production, as well as in the provision of raw materials of every kind to supply the needs of the Empire.

I.—GRAIN CROPS AND PRODUCTS.

1. WHEAT:

	1913–14 *and* 1921–22. *Acreage.*	*Total Yield (Tons).*	*Imports (Tons).*	*Exports (Tons).*	*Available for Consumption (Tons).*
1913	—	201,982·1	122,395·9 (£1,060,346)	26·7 (£226)	324,351·3
1922: Grain	54,604	225,507·6	37,518·0 (£415,678)	4·1 (£74)	263,021·5
Fed off ..	2,884				

Flour :

	1913–14 *and* 1920–21. *Total Production* (*Tons*).	*Imports* (*Tons*).	*Exports* (*Tons*).
1913	142,224·5	66,548·6 (£742,781)	592·1 (£11,475)
1922	177,672·3	20,643·0 (£409,174)	2,096·1 (£33,851)

The following quantities of flour were available for consumption in the Union: 1913, 202,851 tons; 1922, 196,219 tons. A hundred pounds of wheat (1⅔ bushels) yields 70 pounds of flour. Average yield per acre between 10 and 12 bushels.

South Africa is capable of producing a much larger quantity of wheat, and may ultimately become an important wheat-exporting Dominion. Not only is a large extension of the acreage possible, but more intensive methods of cultivation might prove profitable, and the Government Experiment Stations are directing their attention to the production of more fertile varieties adapted to local conditions, as well as of early maturing varieties which would escape the destructive action of the winds that prevail during the present harvesting period (November and December).

2. BARLEY:

	1911 *and* 1921–22. *Acreage.*	*Total Yield* (*Tons*).	*Imports.*	*Exports.*
1913	—	27,296·8	47·5 (£611)	28·8 (£227)
1922:				
Grain and forage	105,727	19,731·0	1·4 (£48)	59·0 (£611)
Fed off	19,404			

Difficulties attending cultivation have helped to keep down the acreage of barley as a grain crop. It does best on irrigated land in areas of low rainfall, where its growth can be regulated, so that with the extension of irrigation schemes an extension of acreage may be anticipated.

3. OATS:

	1911 *and* 1921–22. *Acreage.*	*Total Yield* (*Tons*).	*Yield per Acre.*	*Imports.*	*Exports* (*Tons and £*).
1913	—	138,008·0	From 17 to 24 bushels	285·9 (£2,540)	1,924·7 (£12,874)
1922:					
Grain and forage ..	635,309	74,089·0	—	215·4 (£2,353)	2,040·1 (£16,782)
Fed off	80·989				

Under ordinary conditions this crop pays as well as or slightly better than wheat, and thrives on poor soils. Insufficient attention is paid to purity of seed.

4. RYE:

	1911 and 1920–21. Acreage.	Total Yield (Tons).	Imports (including Rye Meal).	Exports (including Rye Meal).
1913	—	18,098·6	46·5 (£518)	400 lbs. (£1)
1922: Grain	135,252	12,453·3	—	5·9 (£94)
Fed off	75,480			

The extreme hardiness of this cereal adapts it for cultivation on the poorer sandy soils, where it does much better than wheat, barley, or oats.

5. MAIZE:

	1913–14 and 1920–21. Acreage.	Total Yield (Tons).	Yield per Acre.	Imports (Less Re-exports) (Tons).	Exports (Tons).
1913	—	907,633·9	About 10 bushels on the average	8,677·6	57,264·2
1922: Grain ..	4,598,595	879,887·4		0·86 (£18)	47,336·6 (£1,426,376)
Fed off ..	106,597				

This is the leading crop in South Africa, which is consequently a maize-exporting country of increasing importance. The Government is giving special attention to its development, by introducing improved varieties, promoting better cultivation, and in various other ways. The maize zone possesses the following advantages over the "corn belt" of the U.S.A.: (1) There is a longer growing season by from four to seven weeks, which considerably extends the time for sowing; (2) the atmospheric conditions are drier in the Union, resulting in grain of lower moisture content, more suitable for transport and manufacturing purposes.

Maize-Meal:

	1913–14 and 1920–21. Total Production (Tons).	Imports (Tons).	Exports (Tons).
1913	251,571·4	572·7	1,934·3
1922	456,140·1	0·9 (£10)	47,336·6 (£290,055)

6. RICE.—The imports (tons) were as follows: 1913, 40,435 (£444,426); 1922, 30,485 (£423,081).

7. KAFFIR CORN:

	Acreage.	Total Yield (Tons).	Yield per Acre (Cwts.).
1911	—	138,189·7	—
1921–22	171,840	55,607·3	6·5

Though a considerable amount of grain is produced, Kaffir corn is chiefly useful as a fodder crop (see p. 71). It thrives under semi-arid conditions unsuitable for maize. When grown for grain production it is particularly liable to injury by birds, and is therefore suitable for areas where these do not cause trouble, as over most of the bare veld. Red-grained varieties are less liable to attack, as they contain a distasteful astringent principle, but unfortunately this also makes them unpalatable to stock.

II.—Root Crops.

1. Turnips, Swedes, and Mangels.—These occupy a subordinate position, the acreage being 11,866 in 1921.

2. Potatoes:

	*Acreage.**	*Total Yield (Tons).*
1913–14	Figures not available.	
1920–21	94,859	100,011·1

3. Sweet Potatoes:

	*Acreage.**	*Total Yield (Tons).*
1913–14	Figures not available.	
1920–21	22,465	28,588·8

III.—Pulse Crops.

Peas and Beans:

	*Acreage.**	*Total Yield (Tons).*
1913–14	Figures not available.	
1920–21	67,459	32,298·6

* Not including native locations, reserves, etc.

IV.—Grass and Forage Crops.

Extensive grass lands cover the eastern part of South Africa and offer an almost unlimited amount of grazing. There are three different types: (1) Eastern Mountain Grassveld, distinguished by its tufted or tussocky character, and characteristic of the eastern slopes of the Stormberg and Drakensberg ranges; (2) the High Veld covering most of the Orange Free State and the southern Transvaal, and consisting of vast rolling plains and table-lands covered by grasses and mixed herbage; (3) the Eastern Grassveld, typical of a narrow strip running from Port Elizabeth to northern Natal.

1. Sown Grasses.—Ordinary European grasses do not thrive particularly well in the Union, and are consequently not much favoured, but for 1920-21 the acreage was 32,829. *Teff*, a grass introduced from Abyssinia, does much

better, and the acreage of this for the same year was 260,499, giving a hay yield of 156,589 tons.

2. MANNA.—This is a kind of millet grown for forage purposes. In 1920-21 the acreage was 66,856, the yield of grain 1,149·5 tons, and the weight of forage 32,367·4 tons.

3. LUCERNE (Alfalfa).—This hardy perennial long-rooted plant is the best forage crop, and with the development of the live-stock industry and irrigation schemes its cultivation has steadily advanced. There were 142,112 acres under cultivation in 1920-21, when the hay yield was 832,061 tons.

4. HAY AND GREEN FORAGE.—To teff, lucerne, and manna hay must be added the large amounts made from various cereals, while considerable acreages of these are used as green forage and fed off. The figures for 1921-22 are as follows:

	Wheat.	*Barley.*	*Oats.*	*Rye.*	*Maize.*
Hay (tons)	—	9,740	164,790	—	—
Fed off (acres)	2,884	19,404	80,989	75,480	106,597

5. ENSILAGE.—The quantity made in 1920-21 amounted to 79,595·5 tons.

V.—SUGAR CROPS.

1. SUGAR CANE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1918	184,213	—	20 in Natal.
1921	196,585	—	More in Zululand.

Sugar cane is grown for sugar production in Natal and Zululand. All the best sugar land is under cultivation in the former, but there are large areas in Zululand well suited for the purpose and awaiting development. The Natal crop requires two years to mature, as compared with eighteen months for Zululand.

Cane Sugar :

	1913–14 *and* 1920–21. *Production (Tons).*	*Imports (Cane and Beet) (Tons).*	*Exports (Domestic Produce) (Tons).*
1913	82,279·4	26,096 (£343,172)	159 (£3,113)
1922	128,285·7	11,288 (£394,154)	61,499 (£2,065,359)

The amount of sugar (all kinds) available for consumption was 103,588·4 tons in 1913–14, and 91,968·7 tons in 1920–21. The amount used in manufacturing during the latter year was 15,080 tons.

There is ample provision of sugar-mills for the industry, and two refineries in Natal deal with the mill-products, thus checking the importation of refined sugar.

VI.—Fruit.

The Union presents unlimited possibilities in the direction of fruit-growing, as might be expected from the great varieties of soil and climate. There is no spot where some known fruit will not grow and thrive, ranging from apples and pears, soft fruits (grapes, peaches, apricots, plums, etc.), and citrus fruits, to tropical kinds such as bananas and pineapples, all of these being grown on a commercial scale. An export trade came into existence in the closing years of last century, and the modest initial shipment of 309 tons had by 1900 expanded to 6,460 tons.

1. Fresh Fruits.—In 1911 and 1921 there were, respectively, 11,305,447 and 16,131,626 fruit trees of all kinds in the Union; the value of fresh fruit imported during 1922 was £15,647, and the value of the exports for that year £514,887.

2. Dried Fruits.—Imports and exports for 1913 and 1922 (tons):

Imports.

		Currants.	*Raisins.*	*Dates.*	*Figs.*	*Other Fruits.*
1913	Tons	731·7		1,388·7	91·3	540·2
	£	(£23,926)		(£23,772)	(£3,948)	(£24,929)
1922	Tons	482	18·5	923	39·4	40·5
	£	(£30,617)	(£3,011)	(£33,859)	(2,417)	(£3,287)

Exports.

		Currants.	*Raisins.*	*Dates.*	*Figs.*	*Other Fruits.*
1913	Tons	(and figs)	7·6	4·1	—	15·7
	£		(£339)	(£72)	—	(£892)
1922	Tons	2·3	5,302·8	20·9	—	1,307·7
	£	(£255)	(£249,412)	(£1,320)	—	(£60,598)

3. BOTTLED AND CANNED FRUITS:

	Imports.		*Exports.*	
1913	Tons	432·1	Tons	24·4
	£	18,653	£	977
1922	Tons	87	Tons	761·4
	£	8,752	£	40,922

4. FRUIT PULP:

	Imports.		*Exports.*	
1913	Tons	52·2	Tons	—
	£	1,915	£	—
1922	Tons	39·4	Tons	—
	£	2,614	£	—

5. JAMS AND JELLIES:

	Imports.		*Exports.*	
1913	Tons	988·2	Tons	209·7
	£	40,824	£	7,534
1922	Tons	351·4	Tons	168·1
	£	41,198	£	9,555

6. FRUIT JUICES AND SYRUPS:

Imports.		*Exports.*	
1913	£17,756	1913	£ —
1922	£4,913	1922	£2,303

VII.—EDIBLE NUTS.

Only almonds and walnuts are at present cultivated on the commercial scale, but the supply is quite inadequate and there is considerable scope for heavy planting, to which many districts are particularly well suited. There are also possibilities, particularly in Natal, of pecan nut cultivation. The imports and exports for 1922 are as follows:

IMPORTS.

		Almonds.	*Walnuts.*	*Coconuts.*	*Other Nuts.*
1913	Tons	102·4	12·3	—	158·2
	£	14,416	661	2,595	9,875
1922	Tons	125·8	70·5	269	227·6
	£	21,742	4,717	3,155	13,231

EXPORTS.

		Almonds.	*Walnuts.*	*Coconuts.*	*Other Nuts.*
1913	Tons	720 lbs.	—	—	2·2
	£	54	—	—	134
1922	Tons	1·0	—	—	3·3
	£	172	—	—	369

VIII.—VEGETABLES.

1. FRESH VEGETABLES.—The acreages and yields for onions and pumpkins were as follows in 1920-21:

	Acreage.	*Yield.*	*Imports* (1922).
Onions	4,965	10,399·5 tons	59·6 tons (£729)
Pumpkins ..	—	15,236,214 (number)	—

2. PRESERVED VEGETABLES.—Imports (tons): 1913, 1,435 (£46,154); 1922, 308·5 (£20,797).

IX.—MISCELLANEOUS.

The following figures refer to imports (tons and £):

	1913.		1922.
Tapioca and sago	541·1 (£9,676)	..	432·5 (£8,678)
Biscuits	999·6 (£60,394)	..	99·2 (£12,019)
Cakes	92·9 (£8,285)	..	15·6 (£3,059)
Various farinaceous foods	255·4 (£23,443)	..	269·9 (£50,689)
Confectionery	2,691·6 (£248,830)	..	44·5 (£12,268)
Baking powder	309·8 (£46,761)	..	434·5 (£98,933)
Seeds for food	122·1 (£3,007)	..	175·2 (£6,538)
Sweets	(included in Confectionery)	..	1,336·1 (£282,539)
Poultry food	164·6 (£2,303)	..	77·4 (£4,457)
Edible oils	267,863 gals. (£45,127)	..	224,286 gals. (£56,737)
Table waters	£14,066	..	£2,748

X.—Potable Alcohol (and Vinegar).

1. Spirits, Liqueurs, and Cordials.—The chief figures for 1913 and 1922 were as follows:

		Brandy.	*Whisky.*	*Gin.*	*Rum.*	*Liqueurs and Sweetened.*
Production:						
1913	Gallons	1,726,968	—	—	—	—
1921	,,	2,803,914	—	—	2,285,062	—
Imports:						
1913	Gallons	74,861	549,604	154,073	13,944	11,703
	£	61,968	250,109	24,797	6,217	7,212
1922	Gallons	22,021	331,046	27,323	3,556	6,124
	£	28,751	378,913	16,589	3,114	6,620
Exports:						
1913	Gallons	2,101	11,415	2,760	100,648	2,420
	£	1,647	5,612	582	2,116	1,329
1922	Gallons	3,098	11,579	2,702	333	3,756
	£	3,171	12,322	1,513	271	3,982

2. Malt Liquors.—The chief figures for 1913 and 1922 were as follows:

		Malt.	*Hops.*	*Ale, Beer, and Stout (Gallons).*
Production:				
1913	Tons	—	Statistics not available.	—
	£	—		—
1922	Tons	—		8,594,822 (1920–21)
	£	—		1,685,336 (1920–21)
Imports:				
1913	Tons	5,134		231,820
	£	87,405		40,742
1922	Tons	392		65,201
	£	12,197		23,537
Exports:				
1913	Tons	888 lbs.		35,874
	£	11		1,390
1922	Tons	3		57,607
	£	114		10,889

3. Cider and Perry.—Imports (gallons and £): 1913, 6,343 (£1,369); 1922, 1,016 (£488).

4. Wine.—Viticulture is a very old industry in South Africa, and should have a great future. In 1921, 55,048 acres were under vines, of which 84,970,260

plants were bearing and 17,137,724 non-bearing. Part of the product is used in the manufacture of wine, brandy, and vinegar, while table-grapes are grown on an increasingly large scale, and the raisin and currant industry is also one of great promise. Figures for all these, except wine, have been given elsewhere.

The depression of the wine market towards the end of 1917 led to the establishment of the Co-operative Wine Farmers' Association of South Africa, Ltd., which was joined by over 95 per cent. of the wine farmers and practically all the wine merchants in the Western Province of the Cape, and the object of which is to guarantee a minimum price for wine and thus to ensure a stable market. The chief figures for 1913 and 1922 are as follows:

		Production.	*Imports.*	*Exports (Home Produce).*
1913	Gallons	—	72,987	80,133
	£	—	60,214	19,262
1922	Gallons	13,318,281	39,713	433,987
	£	—	39,554	76,722

5. VINEGAR.—Imports (gallons and £): 1913, 111,236 (£11,016); 1922, 40,295 (£8,796).

SOUTH-WEST AFRICA

This extensive territory, now attached to the Union of South Africa, has an area of about 322,000 square miles, approximately three-quarters that of the Union proper. The total population in 1921 was 227,739, of which 19,432 were Europeans.

Most of the territory is well adapted for stock-farming, and is not only self-supporting as regards beef and mutton, but has an available surplus for export. For the most part, however, the climatic conditions are unfavourable to agriculture. The average annual rainfall varies from about an inch along the coastal belt to 6 inches in the south, 12 inches in the centre, and about 22 inches in the north. This lack of moisture is compensated to some extent by irrigation, and further developments in this direction are possible, and there is a considerable subterranean water supply.

An agricultural census taken in 1921 gave the following figures: Farms, 1,515. Acreages: cultivated, 26,598; under crops, 26,140 (maize, 19,558; wheat, 1,202); irrigated, 3,303; irrigable, 15,894. Production (tons): wheat, 357·5; maize, 3,041·5; oats, 6·5; Kaffir corn, 185·1; potatoes, 359·1. Number of fruit trees: 36,940. Number of vines: 57,800.

The shortage of agricultural products is made good by imports from the Union.

BASUTOLAND

Area, 11,716 square miles—nearly that of Belgium; population (1921), 498,781 (1,603 Europeans). The farmers are all natives, and there is a considerable surplus of agricultural produce available for export, as will be seen by

the following tonnages for 1920: Wheat and wheat-meal, 7,919·1 (£218,386); oats and barley, 7·3 (£108); maize and maize-meal, 2,567·3 (£21,352); Kaffir corn, 17,070·5 (£26,553); beans and peas, 276·6 (£4,763).

BECHUANALAND PROTECTORATE

Area, 275,000 square miles; population (1921), 152,983 (1,743 Europeans). In favourable seasons maize, Kaffir corn, beans, pumpkins, and melons are produced in considerable quantities, but the rainfall (annual average, 20 to 25 inches) is so uncertain and unequally distributed that agriculture is a precarious industry. No statistics are kept of imports and exports, but in good years there is a surplus of maize and Kaffir corn for export.

SWAZILAND

Area, 6,678 square miles; population (1921), 112,951 (2,205 Europeans). The average annual rainfall throughout the territory is about 44 inches, and various crops are grown with success, the chief being maize and Kaffir corn. The cereal production for 1921 was estimated (in bags) at: maize, 29,025; Kaffir corn, 1,136; wheat, 110; oats for forage, 25·9 (tons). Fruits of all kinds do well, but the present production only suffices for home consumption. Many citrus plantations are being started, and successful results are anticipated. No statistics of imports and exports are kept. Maize, flour, groceries, and spirits figure among the former.

RHODESIA

This extensive African territory is divided into: (1) Northern Rhodesia: area, 291,000 square miles; population (1921), 983,539. (2) Southern Rhodesia: area, 149,000 square miles; population (1921), 899,187. Until quite recently the whole of Rhodesia was administered by the British South African Company, but Southern Rhodesia has recently (October 1, 1923) acquired powers of self-government, while Northern Rhodesia is expected to become a Crown Colony.

Northern Rhodesia.

The chief industry being ranching, this subterritory is of but little importance as regards crops, etc.

Chief Imports.

		1913.	1921.
Sugar	Tons	186	224
	£	4,729	11,651
Spirits	Gallons	10,662	14,656
	£	5,853	20,315

Chief Exports (Domestic Produce).

		1913.	1921.
Maize	Tons	2,500	4,230
	£	25,266	22,240
Maize-meal	Tons	1,204	1,731
	£	13,988	13,872

Southern Rhodesia.

Maize is the chief corn crop, but wheat, barley, and oats are grown to some extent, especially on irrigated lands, but are liable to be attacked by rust. The cultivation of fruit, especially citrus species, is of increasing importance.

Chief Imports.

		1913.	1921.
Flour, wheat	Tons	4,300	5,076
	£	55,859	54,198
Sugar	Tons	2,507	1,741
	£	42,069	70,560
Brandy	Gallons	37,296	33,542
	£	15,607	31,647
Whisky	Gallons	70,407	51,056
	£	38,285	58,793

Chief Exports (Domestic Produce).

		1913.	1921.
Maize	Tons	3,492	31,407
	£	24,074	146,854
Maize-meal	Tons	1,105	9,316
	£	9,844	76,556

KENYA

Area, about 200,000 square miles; population (1921), 2,529,133. The colony, formerly known as British East Africa, offers great possibilities by way of agricultural development. Tropical food plants flourish in the low-lying coastal belt, while the conditions on the higher land of the interior are favourable to cereals and other crops. So far, coffee production, stock-raising, and dairying have received most attention, but a certain amount of grain is exported. It is quite possible that Kenya may become an important wheat-growing country in the future.

About 1,750,000 acres are under cultivation, maize occupying approximately a quarter of this area. The chief native crops for supplying the staple foods are maize, millet, beans, and sweet potatoes. The best food crops for cultivation by highland farmers are maize, peas, beans, and potatoes.

For the low coastal lands sugar cane affords possibilities, while bananas and coconuts are of local importance. In some districts the growing of citrus fruits is capable of considerable development.

[The imports and exports of Kenya and Uganda are returned together.]

KENYA AND UGANDA: CHIEF IMPORTS.

		1913–14.	1920–21.
Rice	Tons	7,052	4,556
	£	74,874	153,033
Flour and wheat-meal	Tons	3,676	4,225
	£	42,477	136,551
Sugar	Tons	4,511	2,593
	£	61,806	205,551
Ale and beer	Gallons	52,015	67,457
	£	8,125	28,017
Whisky	Gallons	45,698	55,293
	£	23,504	82,802
Other spirits	Gallons	18,983	31,081
	£	9,591	47,443
Wines	Gallons	35,299	40,912
	£	16,646	57,138

EXPORTS.

		1913–14.	1920–21.
Maize	Tons	11,322	
	£	53,920	

UGANDA

The Protectorate has an area of 110,300 square miles (including 16,377 square miles of water). Population (1921), 3,006,327 (1,280 Europeans). There are extensive tracts of fertile soil, but apart from coffee there is no export of vegetable food products.

[Imports and exports returned with those of Kenya. *See above.*]

TANGANYIKA TERRITORY

This extensive territory, formerly known as German East Afrcia, has an estimated area of 384,180 square miles, native population of about 4,100,000, and white population of 2,447. Forestry and mining are here most important, but grain and pulse are included in the agricultural exports.

There is a Government Department of Agriculture, which teaches and encourages the natives to grow bigger and better crops, which are of the same kinds as described for Kenya, assists non-native settlers in crop production, controls insect and fungoid pests, and carries out a variety of experiments and investigations.

A Biological and Agricultural Institute has been established at Amani, and it is proposed to make this an information bureau and a centre of research for all the British territories in East Africa.

CHIEF IMPORTS (1921.)

Flour ..	Tons	625
	£	16,904
Sugar ..	Tons	555
	£	22,338
Provisions ..	Tons	16
	£	40,850
Beer and cider	Gallons	19,640
	£	7,797
Spirits ..	Gallons	22,067
	£	34,920
Wine	Gallons	9,565
	£	8,670

CHIEF EXPORTS (1921).

Millet ..	Tons	11,721
	£	78,133
Rice	Tons	2,787
	£	58,446
Maize ..	Tons	1,317
	£	9,075
Other grain ..	Tons	3,080
	£	30,730
Peas and beans	Tons	270
	£	2,669
Other pulses	Tons	273
	£	4,090

ZANZIBAR

The area of the Protectorate, including the smaller island of Pemba, is 1,020 square miles, and the population 196,533. Cloves and copra are the chief vegetable productions, and are largely exported, but Zanzibar is also an important emporium, and re-exports large quantities of rice, grain, etc.

The acreages in 1922 were: cloves, 48,000; coconuts, 55,000; other crops, 275,000. This last area is cultivated by the natives for the purpose of producing food crops for local consumption. The most important of these is cassava, and millet is the chief cereal. Rice is also grown, but not in sufficient quantity to meet the demand. Other crops include maize (a small amount), various pulses, yams, and taro. The produce of native gardens embraces Congo or chick peas, sweet potatoes, pumpkins, and tomatoes.

The leading fruits are bananas, pineapples, and citrus of various kinds.

CHIEF IMPORTS.

	1913.	1921.
Rice	£177,076	£228,551
Other grain	37,007	87,359
Flour	19,269	41,303
Sugar	31,143	85,746
Groceries (general) ..	65,627	—

NYASALAND PROTECTORATE

Area, 39,956 square miles; population (1921), 1,201,983 (1,486 Europeans). The chief products at the present time are cotton, tobacco, tea, and coffee, but many kinds of tropical fruit flourish, and on the higher ground apples, peaches, pears, and strawberries do well.

CHIEF IMPORTS.

	1913.		1921.
Provisions	£31,622	Provisions	£26,931
Potable alcohol	2,792	Beer and ale	3,103
		Wines and spirits	22,932

BRITISH SOMALILAND

This Protectorate has an area of about 68,000 square miles, and the population is estimated at 300,000. Stock-raising is the most important industry, but there is some export of maize and millet.

IMPORTS.

		1913–14.	1921.
Grain:			
Jowar	Tons	1,063	159
	£	6,615	3,221
Rice	Tons	7,054	3,350
	£	59,746	78,444
Flour	Tons	601	152
	£	5,525	4,206
Sugar	Tons	1,281	628
	£	16,460	35,799
Dates	Tons	3,190	3,234
	£	20,534	71,558

MAURITIUS

Area, 720 square miles; population (1921), 376,474 (including 265,455 Indians). The Dependencies include the Island of Rodriguez (area, 40 square miles; population, 6,584) and also most of the groups of small islands of the Indian Ocean, these having, collectively, a population (1921) of 1,365. The cultivated acreage of Mauritius is 206,419, of which 173,519 is under sugar-cane. Sugar is exported on a large scale. There is some export of beans from Rodriguez, while coconuts are the staple industry in the scattered islands.

CHIEF IMPORTS.

		1913.	1921.
Grain and pulse:			
Rice	Tons	62,627	45,111
	£	567,627	663,518
Other (with oatmeal and pollard) ..	£	101,291	230,884
Flour, wheat	£	66,865	216,883
Wine	£	38,356	175,998

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Sugar, raw	Tons	184,996	225,760
	£	2,048,721	10,309,520

SEYCHELLES

The total area of these islands is 156 square miles, with a population (1921) of 24,523. The most important product is copra.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	2,245	1,354
	£	19,936	17,386
Pulse	Tons	132	52
	£	1,056	758
Flour	Tons	237	189
	£	2,536	4,053
Sugar	£	3,890	6,473
Spirits, etc.	£	2,139	2,186
Wine	£	3,539	1,268

AMERICA

CANADA

The Dominion has an area of 3,729,665 square miles, and a population of 8,787,998 millions (1921). The population is very unequally distributed, there being only 12,145 inhabitants in the Yukon and North-West Territories, which comprise 1,449,300 square miles, the larger part of this vast area being within or near the Arctic Circle (in the same latitude as Greenland), and therefore unsuitable for settlement. On the other hand, over three-fifths of the total population (5,294,861) live in the Provinces of Ontario and Quebec, of which the combined area is 1,114,096 square miles, less than one-third of the total area of the Dominion. The rural is somewhat larger than the urban population, but in the latter are included residents in many small villages. In spite of a distinct tendency to " urban drift," Canada is much less urbanized than the U.S.A., and there are only two cities (Montreal and Toronto) with over half a million inhabitants.

The field crops characteristic of temperate climates, especially cereals, are cultivated on a vast scale. The acreage for 1921 was 59,635,346 (over one and a half times the total area of England and Wales), and the value of the yield 931,865,670 dollars (about £29,156,584). Commercial fruit-farming is an important industry in the eastern provinces and British Columbia, and 4,046,813 barrels of apples, worth 29,898,649 dollars, were produced in 1921.

" Canadian agriculture rests upon an unusually generous endowment of cultivable lands. Present information permits only a rough estimate of their actual extent, but it is certain that for many years it will still be necessary to

measure the Dominion's total arable area mainly by the untilled acreage rather than by that under cultivation. Of the 300,000,000 acres believed to be physically suitable for agriculture, only 60,000,000 acres, or one-fifth of the total, have been placed under field crops. The remaining four-fifths, comprising some 240,000,000 acres, are capable of sustaining many added millions of population, and they include an immense acreage sufficiently ripe for settlement as to ensure that the extension of agriculture will continue to be a main highway of Canada's material progress. Despite the rapid advance of settlement during the last two decades there are to-day, in the three prairie provinces of Manitoba, Saskatchewan, and Alberta alone, at least 25,000,000 acres of unoccupied lands situated within fifteen miles of existing railways and available for purchase at figures representing but a fraction of the values placed upon lands of no greater fertility in the older farming communities of the Dominion and of the United States."

"The distribution of arable lands is such that Canada possesses not an unbroken belt, but a series of agricultural areas between Prince Edward Island on the Atlantic coast and Vancouver Island on the Pacific, characterized by diversity of contour, soil, and climate, and by corresponding variety of crop production. Each of the nine provinces includes extensive arable areas and supports agricultural development on a very substantial scale. The estimates of the areas in the various provinces regarded as actually or potentially valuable for agriculture are subject to revision as more complete data become available, but, in conjunction with the statistics of the acreage already placed under field crops, they serve to suggest the magnitude of the present agricultural industry of Canada and of the lands which invite new or more intensive settlement.

"The acreage under field crops does not constitute the entire area occupied as farm lands. A large addition is required to include the acreage devoted to orchards, grazing, and other purposes. But a liberal allowance for such uses as are not covered by the term "field crops" still leaves it clearly evident that the existing measure of agricultural development is but an indication of the Dominion's potential capacity for food production, whether it be in the form of grain, vegetable, and other field crops, or of live-stock and animal products representing the finished output of mixed farming" (*Canada, Natural Resources and Commerce*, Ottawa, 1923, pp. 40-42).

I.—Grain Crops and Products.

1. Wheat:

	Acreage (Thousands).	*Total Yield (Thousands of Bushels and $).*	*Yield per Acre (Bushels).*	*Imports (Thousands of Bushels and $)*	*Exports (Thousands of Bushels and $).*
1913–14 ..	11,015	231,717 ($156,462)	21·04	—	120,426 ($117,719)
1921–22 ..	23,261	300,858 ($242,936)	13·0	371·6 ($522·0)	136,489 ($179,990)

The average consumption per head is about five bushels.

Average price per bushel: 1913, 0·67 dollar; and 1921, 0·81 dollar.

Wheat-meal and Flour :

	Imports (*Thousands of Barrels and* $)	*Exports* (*Thousands of Barrels and* $)
1913–14	—	4,832 ($20,581)
1921–22	39·9 ($273·1)	7,414 ($53,478)

(39,479,000 bushels of the 1921 crop were milled for food).

Macaroni and Vermicelli :

	Imports (*Thousands of Lbs. and* $)	*Exports* (*Thousands of Lbs. and* $)
1913–14	—	—
1921–22	1,096·7 ($114·8)	2,695 ($241)

Bran, Sharps, and Middlings (*Thousands of Short Cwts. and Dollars*).—955 tons (1,104 dollars) were exported in 1921-22; also 386 tons (54 dollars) of screenings.

" Among Canadian field crops wheat stands first. No other natural product, whether of agricultural, forest, mineral, or marine origin, has exercised such vitalizing influence upon the economic life of Canada in recent years. Wheat has been the most powerful factor in attracting population and capital to the Dominion, in bringing virgin areas under cultivation, in widening the market for domestic manufacturing, mining and other industries, in building up the volume and value of export trade, and in creating the purchasing power necessary to finance Canada's heavy imports of textiles, iron and steel, sugar, coal, and other essentials which, for various reasons, are drawn wholly or largely from abroad."

" At the opening of the present century, the excellence of Canadian hard wheat had gained recognition in the world's principal grain markets, but the colonization of the wheat lands of Western Canada had scarcely begun. Then came the tide of settlement, and Canadian wheat production rose from 56,000,000 bushels in 1900 to 132,000,000 bushels in 1910, and to the record total of 400,000,000 bushels in 1922 " (*op. cit.*, pp. 49, 50).

2. BARLEY:

	Acreage (*Thousands*).	*Total Yield* (*Thousands of Bushels and* $).	*Yield per Acre* (*Bushels*).	*Exports* (*Thousands of Bushels and* $).
1913–14	1,613	48,319 ($20,144)	29·96	13,032 ($6,513)
1921–22	2,796	59,709 ($28,254)	21·25	12,581 ($9,821)

Though important the barley crop is small in comparison with wheat and oats, but the production is greater than that of the United Kingdom.

Average price per bushel: 1913, 0·42 dollar; 1921, 0·47 dollar.

3. OATS:

	Acreage (Thousands).	*Total Yield (Thousands of Bushels and $).*	*Yield per Acre (Bushels).*	*Imports (Thousands of Bushels and $).*	*Exports (Thousands of Bushels and $).*
1913–14 ..	10,434	404,669 ($128,893)	38·78	—	34,997 ($13,380)
1921–22 ..	16,949	426,233 ($146,395)	25·25	119·3 ($71·9)	36,195 ($18,717)

Average price per bushel: 1913, 0·32 dollar; 1921, 0·34 dollar.

Oatmeal and Rolled Oats.—Exports (thousands of short cwts. and dollars) 1921-22, 651 (2,525 dollars).

4. RYE:

	Acreage (Thousands).	*Total Yield (Thousands of Bushels and $).*	*Yield per Acre (Bushels).*	*Imports (Thousands of (Bushels and $).*	*Exports (Thousands of Bushels and $).*
1913–14 ..	119·3	2,300 ($1,524)	19·28	53·4 ($36·8)	112·4 ($75·8)
1921–22 ..	1,842	21,455 ($15,399)	11·75	4·0 ($4·4)	3,180·5 ($3,526·6)

5. MAIZE:

	Acreage (Thousands).	*Total Yield (Thousands of Bushels and $).*	*Yield per Acre (Bushels).*	*Imports (Thousands of Bushels and $).*	*Exports (Thousands of Bushels and $).*
1913–14 ..	278·1	16,772 ($10,784·3)	60·30	7,198·4 ($4,691·7)	31 ($23·5)
1921–22 ..	297	14,904 ($12,317)	50·25	14,120·9 ($8,713·3)	25 ($30)

Average price per bushel: 1913, 0·64 dollar; 1921, 0·83 dollar.

Maize-Meal :

	Imports (Thousands of Barrels and $).	*Exports*
1913–14..	51·0 ($168·8)	4 ($15)
1921–22..	35·9 ($136·2)	19 ($94)

6. RICE:

	Imports (Thousands of Lbs. and $).	Exports (Thousands of Lbs. and $).
1913–14..	61,904·8 ($1,542·2)	0·1 ($0·003)
1921–22..	58,315·5 ($2,363·5)	173 ($7)

Rice-Meal, etc.—Exports (thousands of pounds and dollars), 1913-14, 2,614 (46 dollars); 1921-22, 1,065 (23 dollars).

7. MISCELLANEOUS BREAD-STUFFS (thousands of dollars):

	Imports.	Exports.
1913–14	117·6	—
1921–22	168·5	—

II.—ROOT CROPS.

1. TURNIPS, MANGELS, ETC.:

	Acreage (Thousands).	Total Yield (Thousands of Bushels and $).	Yield per Acre (Bushels and $).
1913	186·4	66,788 ($18,643)	358·30 ($0·28)
1921	228	79,150 ($26,620)	347·75 ($0·34)

2. POTATOES:

	Acreage (Thousands).	Total Yield (Thousands of Bushels and $).	Yield per Acre (Bushels).	Imports (Thousands of Bushels and $).	Exports (Thousands of Bushels and $).
1913–14 ..	473·5	78,544 ($ —)	165·88	415·8 ($353·7)	1,981 ($1,127)
1921–22 ..	702·0	107,346 ($82,148)	152·75	429·5 ($501·6)	3,755 ($2,937)

3. TAPIOCA AND SAGO.—Imports (thousands of pounds and dollars), 1913-14, 3·669·1 (91·3 dollars); 1921-22, 566·8 (21·0 dollars).

4. ARROWROOT.—Imports (thousands of pounds and dollars), 1913-14, 103·4 (7·5 dollars); 1921-22, 184·9 (13·5 dollars).

III.—PULSE CROPS.

1. PEAS:

	(Thousands).	Total Yield (Thousands of Bushels and $).	Yield per Acre (Bushels).	Imports (Thousands of Bushels and $).	Exports (Thousands of Bushels and $).
1913–14 ..	218·9	3,951·8 ($4,382)	18·05	125·9 ($267·6)	143 ($263)
1921–22 ..	193	2,770 ($5,439)	14·25	33·8 ($106·3)	262 ($835)

2. BEANS:

	Acreage (Thousands).	Total Yield (Thousands of Bushels and $).	Yield per Acre (Bushels).	Imports (Thousands of Bushels and $).	Exports (Thousands of Bushels and $).
1913–14 ..	46·6	800·9 ($1,505)	17·19	177·4 ($349·3)	11·3 ($29)
1921–22 ..	62	1,090 ($3,156)	17·50	148·1 ($376·7)	11·6 ($32)

IV. AND V.—GRASS AND FORAGE CROPS.

The total pasture acreage for 1921 was 9,977,204.
The following crops were harvested or cut for stock-feeding purposes.

1. FODDER CORN:

	Acreage (Thousands).	Total Yield (Thousands of Short Tons and $).	Yield per Acre (Short Tons).
1913	303·6	2,616·3 ($12,506)	—
1921	585·4	6,362·0 ($44,880)	10·75

2. HAY AND CLOVER:

	Acreage (Thousands).	Total Yield (Thousands of Short Tons and $).	Yield per Acre (Short Tons).
1913	8,169	10,859 ($124,696)	1·33
1921	10,615	1,133 ($11,335)	1·07

3. GRAIN HAY (Alberta):

	Acreage (Thousands).	Total Yield (Thousands of Short Tons).	Yield per Acre (Tons).
1921	—	1,133 ($11,335)	—

4. GRAIN HAY (B.C.):

	Acreage (Thousands).	Total Yield (Thousands of Short Tons).	Yield per Acre (Tons).
1921	58	155 ($3,141)	2·70

5. LUCERNE (Alfalfa):

	Acreage (Thousands).	Total Yield (Thousands of Short Tons and $).	Yield per Acre (Short Tons).
1913	93·5	237·7 ($2,819·2)	2·54
1921	264	662 ($13,211)	2·50

CLOVER AND TIMOTHY SEED were imported to the value (thousands of dollars) of 1,641·5 in 1921-22. The values (thousands of dollars) of clover, lucerne, and grass seeds exported were: 1913-14, 1,201·0; 1921-22, 2,135·6.

Hay, Straw, and other Fodders were exported to the value (thousands of dollars) of 1,816·0 in 1913-14, and 1,102·6 in 1921-22.

VI.—Sugar Crops and Products.

The beet sugar industry is of increasing importance, while that dealing with maple sugar is peculiar to Canada.

1. Sugar Beet:

	Acreage (Thousands).	*Total Yield (Thousands of Short Tons and $).*	*Yield per Acre (Short Tons).*
1913	17	148 ($906)	8·71
1921	28	268 ($1,742)	9·45

Beet Sugar.—The total production in 1913 was 26,149,216 pounds, and 89,280,719 pounds in 1920.

The figures for imports and exports of sugar given under cane sugar include beet sugar.

2. Maple Products:

	Total Production	*Exports.* 1913–14.	*Exports.* 1921–22.
Sugar (thousands of lbs. and $) ..	About 19,800,000 lbs. per annum ($2,000)	1,925·3 ($159·0)	2,092·7 ($164·3)
Syrup (thousands of gallons and $)..		5·2 ($5·2)	3·6 ($9·1)

3. Cane Sugar, etc.

	Imports. 1913–14.	*Imports.* 1921–22.	*Exports.* 1913–14.	*Exports.* 1921–22.
Sugar (cane and beet) (thousands of lbs. and $)	703,957·1 ($15,062·6)	883,283·1 ($41,624·6)	2 ($0·12)	140,883 ($10,922)
Molasses and syrup (thousands of gallons and $)	6,290·8 ($1,592·6)	3,127·9 ($1,555·3)	153 ($11)	1,290 ($66)

VII.—Fruit.

Canadian fruit-growing is an attractive and progressive industry practised on a large scale in the Maritime Provinces, Ontario (Niagara District), and British Columbia. All these produce apples and plums, but peaches are only grown in Ontario, while British Columbia is most suitable for cherries. In dealing with the fruit industry of the Maritime Provinces F. W. Freir remarks: "To my mind the orchardists there are not sufficiently scientific, and it would be an advantage in marketing their fruit if they would abandon their old-fashioned barrels, and export their apples in carefully packed square boxes, as in Western America. Boxes are better for choice fruit, as each individual apple is carefully packed, every one can be graded for size and quality, and the fruit will travel without

bruising. I believe there is a movement on foot there to effect these improvements. Granted scientific methods of growing and marketing, there is no reason why the Maritime Provinces fruit should not sell at a higher price" (*Canada the Land of Opportunity*, A. and C. Black, 1919, p. 88).

1. FRESH FRUIT.—The more important details are summarized in the following table:

		Production.	*Imports.* 1913–14.	*Imports.* 1921–22.
Apples	Thousand barrels	Statistics are only available for apples, of which 3,404,340 barrels were produced in 1920 ($29,849)	330·9	110·7
	Thousand $		1,104·3	680·8
Pears	Thousand lbs.		—	10,370·2
	Thousand $		—	584·5
Peaches, apricots, grapes, etc.	Thousand lbs.		30,890·5	19,676·2
	Thousand $		1,290·5	1,491·4
Plums	Thousand bushels		123·5	106·4
	Thousand $		316·5	404·4
Other soft fruits	Thousand $		120·3	92·5
Citrus fruits	Thousand $		977·7	8,573·4
Bananas	Thousand bunches		2,635·0	2,159·8
	Thousand $		2,663·4	5,211·0
Pineapples	Thousand $		345·1	453·0
Other fresh fruits	Thousand $		1,008·7	1,202·7

Exports: apples (thousands of barrels and dollars), 1913-14, 947·3 (3,465 dollars); 1921-22, 1,846 (8,854 dollars). Fresh berries (thousands of dollars), 1913-14, 92 dollars; 1921-22, 309 dollars. Other fresh fruit (thousands of dollars), 1913-14, 320 dollars; 1921-22, 585 dollars.

2. DRIED FRUITS:

		Imports (Thousands of Lbs. and $). 1913–14.	1921–22.
Currants	Lbs.	10,670·3	7,195·2
	$	545·2	1,117·9
Raisins	Lbs.	21,664·3	27,666·6
	$	1,242·2	5,132·7
Figs	Lbs.	3,277·4	3,637·3
	$	186·2	454·4
Dates	Lbs.	4,371·2	6,461·9
	$	243·1	766·0
Prunes and plums	Lbs.	10,592·0	13,705·7
	$	550·1	1,278·5
Other dried fruits	$	293·7	401·4

Exports (thousands of pounds and dollars): apples, 1913-14, 6,082 (412 dollars); 1921-22, 4,358 (536 dollars); other dried, 1913-14, 3·3 (0·35 dollars); 1921-22, 20·4 (1·5 dollars).

3. CANNED AND PRESERVED FRUITS (thousands of dollars):

	1913–14.	1921–22.
Imports	$634·7	$936·7
Exports	$395·0	$1,296·0

4. JAMS AND JELLIES (thousands of dollars):

	1913–14.	1921–22.
Imports	$580·4	$173·2
Exports	—	—

5. FRUIT JUICE.—Imports as follows (thousands of gallons and dollars):

1913–14	138·4 ($179·8)
1921–22	75·3 ($166·8)

VIII.—EDIBLE NUTS.

The chief kinds of nuts produced in Canada are walnuts and hazel nuts. The nut industry has not been developed, but attempts are being made to encourage it.

Imports.		*Exports (Thousands of Lbs. and $).*	
1913–14.	1921–22.	1913–14.	1921–22.
($2,138·6)	($4,534·2)	15 ($1·5)	51 ($13)

IX.—VEGETABLES (INCLUDING ONIONS AND TOMATOES).

	Fresh.	*Dried.*	*Canned.*
Value of imports (thousands of $):			
1913–14	$2,438·2	—	$698·5
1921–22	$3,531·5	7·9	$889·9
Value of exports (thousands of $):			
1913–14	—	($141)	
1921–22	$242	$5·4	$322

X.—MISCELLANEOUS.

1. BUCKWHEAT.

	Acreage (Thousands).	*Total Yield (Thousands of Bushels and $).*	*Yield per Acre (Bushels).*	*Exports (Bushels and $).*
1913–14.. ..	380·7	8,372 ($5,320)	21·99	173 ($120)
1921–22.. ..	360·7	8,230 ($7,285)	22·75	403 ($362)

2. VARIOUS FOODS:

	Value of Imports (Thousands of $).		Value of Exports (Thousands of $).	
	1913–14.	1921–22.	1913–14.	1921–22.
Biscuits, bread, prepared cereals, etc. ..	1,599·3	929·0	2,182	906
Confectionery, etc.	1,043·1	1,673·3	44	47
Cocoa butter	318·6	1,430·2	—	—
Edible oils..	593·1	763·7	—	—
Oilcake and meal	144·1	229·0	832	1,010
Mineral and aerated waters	293·8	166·5	1·9	63·3

XI.—POTABLE ALCOHOL.

1. SPIRITS, LIQUEURS, AND CORDIALS (thousands of gallons).—The produce of distilleries was 6,458·4 in 1913, and 4,195 gallons in 1921.

Figures of imports and exports as follows (thousands of gallons and dollars):

	Brandy.	*Whisky.*	*Gin.*	*Rum.*	*Other.*	*Liqueurs, etc.*
Imports:						
1913–14 ..	586·9 ($1,179·9)	1,550·4 ($2,940·9)	1,232·1 ($892·7)	219·9 ($118·7)	6·8 ($11·7)	98·0 ($237·3)
1921–22 ..	113·3 ($1,715·9)	908,221 —	190·9 ($2,350·1)	111·0 ($662·3)	7·0 ($30·4)	37,527 —
Exports:						
1913–14 ..	— —	337·3 ($1,038)	— —	— —	0·43 ($0·78)	— —
1921–22 ..	— —	194 ($926)	— —	— —	529 ($587)	— —

2. MALT LIQUORS:

		Production.		*Imports.*		*Exports.*	
		1913.	1921.	1913–14.	1921–22.	1913–14.	1921–22.
Malt	Thousand lbs.	—	—	10,219·0	9,084·0	156·1	4,484·9
	Thousand $	—	—	($238·3)	($261·6)	($4·2)	($237·5)
Hops ..	Thousand lbs.	—	—	1,957·0	2,141·7	253	780
	Thousand $	—	—	($579·8)	($778·9)	($54)	($380)
Ale, beer, and porter ..	Thousand gals.	52,314	25,510	2,082·1	46·7	10	473
	Thousand $	—	—	($1,338·8)	($110·4)	($3·5)	($849)

3. CIDER (thousands of gallons and dollars):

Imports.		*Exports.*	
1913–14.	1921–22.	1913–14.	1921–22.
5·8 ($3·3)	2·4 ($3·5)	151 ($18)	131 ($71)

4. WINE (thousands of dollars).—Imports: 1913-14, 1,577·2; 1921-22, 1,184·6. Exports: 1913-14, 4·4; 1921-22, 3·6.

5. VINEGAR (thousands of gallons and dollars):

Production.		*Imports.*		*Exports.*	
1913.	1920.	1913–14.	1921–22.	1913–14.	1921–22.
2,219 gallons	2,694 gallons	215·3 ($83·0)	98·2 ($43·1)	0·33 ($0·082)	66·9 ($22)

NEWFOUNDLAND

This Dominion, the oldest overseas part of the Empire, has an area of 42,750 square miles, and a population (1921) of 259,317, while the corresponding figures for the dependency of Labrador are 120,000 and 3,621. Though agriculture is not the leading Newfoundland industry, the possibilities are considerable, there being extensive fertile tracts near the seaboard, while in the great valleys of the interior there are some three million acres capable of cultivation. Labrador, however, is of no agricultural importance. Newfoundland horticulture has not been fully developed, but the ordinary kinds of fruit and vegetables familiar in the United Kingdom give satisfactory yields, so with increasing population considerable advances may be anticipated.

The export of food of vegetable origin is inconsiderable, the contrary being true as regards imports.

CHIEF IMPORTS.

		1913–14.	1920–21.
Flour	Barrels	375,729	303,675
	£	374,841	833,318
Oats	Bushels	498,843	613,382
	£	44,327	130,408
Sugar	Tons	5,920	3,542
	£	81,379	261,137
Molasses	Gallons	1,001,470	778,000
	£	42,951	165,665
Confectionery	£	19,817	51,358
Fruit	£	56,151	102,437
Hay	Tons	5,787	10,357
	£	17,091	77,038
Oilcakes and other cattle food	Tons	—	3,221
	£	31,126	42,594

BERMUDAS

Area, 19 square miles. Population (1921), 21,987 (7,507 whites). Onions, potatoes, and other vegetables are largely produced, and there is a considerable surplus, which is exported to the U.S.A. Bermudan arrowroot is of particularly fine quality.

CHIEF IMPORTS.

		1913.	1921.
Oats	Tons	3,513	4,190
	£	17,823	32,833
Flour and meal	£	20,445	41,503
Bran	£	9,583	22,433
Sugar	Tons	856	862
	£	15,764	18,827
Potatoes	£	11,226	19,515
Canned fruit (and meat)	£	17,558	36,433
Groceries	£	10,849	29,381
Preserves	£	2,586	2,293
Ale and beer	£	14,202	31,130
Spirits	£	6,115	47,936

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Onions	£	8,126	3,665
Potatoes	£	38,803	92,227
Other vegetables	£	17,789	32,819

BRITISH WEST INDIES

The collective area is 12,308 square miles, and the total population over 1¾ millions. By far the most important crop is sugar cane. The West Indian sugar industry (and also that of British Guiana) was formerly in a very flourishing condition, but declined as the production of beet sugar increased, finally being almost ruined by the flooding of the market with bounty-fed Continental beet sugar. It was saved from extinction by the Brussels Sugar Convention (1903), to which the chief European Powers, except Russia, were signatories, and by which it was agreed to do away with bounties promoting the export of sugar for a period of five years. Russia became a signatory, on special terms, in 1907, undertaking not to authorize the export of more than a million tons in any one year. In 1908 the Convention was renewed for another five years, but Britain withdrew from it in 1913, holding that some of the provisions of the Convention, particularly the limitation on Russian export, had been responsible for a rise in prices. During the War, when the sugar shortage was acute, a greatly increased output from the West Indies and British Guiana saved the situation. It is urgently necessary, in the interests of the Empire, to take such steps as may be necessary to prevent a recurrence of the decline by which the sugar industry of these colonies was threatened with extinction.

Fruit production is also of great importance in the West Indies, the export of bananas, in particular, being very considerable. Details are given regarding both sugar and fruit in the brief account of the various islands that follows.

I.—BAHAMAS.

Area, 4,404 square miles. Population, about 53,000, mostly of African descent. The soil and climate are adapted to the cultivation of coconuts, bananas, pineapples, etc., and tomatoes are grown on a considerable scale.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	926	578
	£	12,698	11,330
Flour: wheat and rye	Barrels	46,674	27,701
	£	44,578	41,193
Maize-meal and hominy	Barrels	17,456	13,403
	£	16,986	11,155
Sugar	Tons	17,732	751
	£	13,338	20,769
Preserved fruits (fish, meat, etc.)	£	33,987	9,467
Spirits	£	8,465	47,896

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Pineapples, preserved	Cases	31,172	—
	£	6,188	1,367

II.—JAMAICA.

This is the largest and most important island in the British West Indies, with an area of 4,450 square miles, and a population (1921) of 858,118 (14,476 whites). Maize is the most important grain crop, and there is extensive natural pasturage, largely composed of the native Guinea grass. Fruits, such as bananas and citrus varieties, bulk largely in the exports, while cane sugar and sugar products, particularly rum, are next in importance.

The Cayman Islands (area, 225 square miles; population, 1921, 5,253) are a dependency.

The total acreage in Jamaica capable of being used for agricultural and horticultural purposes is 2,768,160, and of this in 1921-22 Guinea grass occupied 198,699, commons 465,536, and arable 301,457. The acreages in 1920 were: ground provisions (root crops, etc., for local consumption), 74,553; bananas, 55,368; sugar cane, 53,794; mixed cultivations, 38,134; coconuts, 37,837; oranges, 367; maize, 310; rice, 61; arrowroot, 56; vegetables, 37; cassava, 4.

CHIEF IMPORTS.

		1913.	1921.
Maize	Tons	9,647	2,913
	£	52,033	33,353
Rice	Tons	6,831	6,291
	£	84,164	140,917
Flour, wheat	Barrels	324,440	252,885
	£	340,661	632,162
Maize-meal	Barrels	91,616	45,501
	£	77,874	71,285
Ale and beer	Gallons	295,715	176,206
	£	49,286	66,811
Whisky	Gallons	32,883	50,450
	£	11,509	69,510

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Sugar	Tons	4,894	26,837
	£	52,231	509,902
Bananas	Bunches	11,597,881	9,959,144
	£	988,236	1,543,672
Oranges	Thousands	45,864	—
	£	58,968	39,848
Coconuts	Thousands	23,770	24,224
	£	135,487	145,346
Rum	Gallons	953,677	958,788
	£	101,328	1,911,754

III.—TURKS AND CAICOS ISLANDS.

These are attached to Jamaica. Area, 170 square miles. Population (1921), 5,615.

CHIEF IMPORTS.

		1913.	1920.
Rice	Tons	79	38
	£	1,052	2,586
Flour, wheat, and rye ..	Barrels	2,175	1,985
	£	2,040	5,264
Sugar	Tons	92	64
	£	1,257	4,151
Spirits	Gallons	5,900	7,593
	£	807	4,753

IV.—LEEWARD ISLANDS.

These are divided into the following five presidencies:

1. ANTIGUA WITH BARBUDA.—Area, about 108 square miles. Population (1921), 29,767. Sugar cane occupies 52,000 acres, and pineapples are of some importance. Maize, onions, limes, and coconuts are other products.

2. ST. KITTS-NEVIS WITH ANGUILLA.—Area, 150 square miles. Population (1921), 38,214. About 16,200 acres are under sugar cane.

3. DOMINICA.—Area, 291 square miles. Population (1921), 37,000. Lime products are of most importance. Other fruits are grown, and the coconut industry is promoted. The cultivation of sugar cane has been abandoned.

4. MONTSERRAT.—Area, 32½ square miles. Population (1921), 12,120. Limes take first place, and sugar cane is also important. Other crops are yams, sweet potatoes, and onions.

5. VIRGIN ISLANDS.—Area, 58 square miles. Population (1921), 5,082.

LEEWARD ISLANDS: CHIEF IMPORTS.

		1913.	1919.
Rice	Tons	761	630
	£	10,271	24,949
Flour, wheat	£	56,205	155,574
Maize-meal	£	16,005	34,836

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1919.
Sugar	Tons	21,050	20,341
	£	189,726	357,995
Molasses	Puncheons	9,536	4,069
	£	35,761	16,524
Limes	£	40,048	27,915
Lime juice	£	82,408	123,930
Citrate of lime	Tons	271	352
	£	18,035	40,380

V.—TRINIDAD AND TOBAGO.

Trinidad has an area of 1,862 square miles, while that of Tobago is 114 square miles. The combined population (1921) is 365,913. The cultivated acreage is 527,572. The cane sugar and coconut industries are of most importance. There are considerable possibilities as regards fruit.

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	8,409	9,431
	£	116,284	201,798
Tonca beans	Tons	—	47
	£	222,195	14,693
Flour	Tons	23,690	23,647
	£	247,896	596,489
Vegetables	£	25,529	86,153
Malt liquors	Gallons	310,108	101,897
	£	42,540	30,005
Wine	Gallons	126,779	56,770
	£	24,092	44,537

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Sugar	Tons	32,655	46,076
	£	18,067	1,456,274
Molasses	Gallons	339,496	60,729
	£	4,243	2,346
Coconuts	Thousands	16,391	20,434
	£	85,369	108,725
Rum	Gallons	102,323	162,337
	£	10,657	58,552
Bitters	Gallons	32,234	33,333
	£	32,234	33,374

VI.—Windward Islands.

These islands include Grenada, St. Lucia, and St. Vincent.

1. Grenada and the Grenadines.—Area, 146·2 square miles. Population (1921), 73,406. The chief products are cocoa, limes, and coconuts.

Chief Imports.

		1913.	1921.
Rice	Tons	613	239
	£	8,286	6,597
Flour, wheat	Tons	3,166	1,828
	£	42,917	48,299
Sugar	Tons	1,050	890
	£	13,692	19,237

2. St. Lucia.—Area, 233 square miles. Population (1921), 52,250. Sugar, limes, and coconuts are the main products.

Chief Imports.

		1913.	1921.
Rice	Tons	191	101
	£	2,438	2,857
Flour, wheat	Tons	1,378	1,033
	£	16,958	27,995
Oils, edible	Gallons	33,529	24,317
	£	5,346	5,497

Chief Exports (Domestic Produce).

		1913.	1921.
Sugar	Tons	4,602	3,238
	£	65,513	80,820

3. St. Vincent.—Area, 150 square miles. Population (1921), 44,447. Arrowroot and sugar are of most importance. Among minor crops may be mentioned maize, coconuts, peas and beans, fruit, and vegetables.

Chief Imports.

		1913.	1921.
Rice	Tons	251	178
	£	4,049	4,743
Flour, wheat	Tons	1,175	915
	£	15,343	22,967
Bread and biscuits	£	4,192	1,473

Chief Exports (Domestic Produce).

		1913.	1921.
Arrowroot	Tons	1,932	934
	£	53,607	21,216
Sugar	Tons	0·1	164
	£	2	3,514

VII.—Barbados.

The area of this island is about 166 square miles, and the population in 1921 was 156,312. The cultivated area in 1913 was 64,000, out of a possible 74,000. The sugar industry is of most importance.

Chief Imports.

		1913.	1921.
Rice	Tons	4,895	5,390
	£	65,791	150,923
Oats	Tons	3,035	2,460
	£	22,660	68,868
Flour, wheat, or rye	Barrels	87,411	98,392
	£	87,411	245,982
Maize-meal	Barrels	30,050	42,526
	£	22,537	42,527
Oilmeal and oilcake	Tons	1,606	2,585
	£	11,691	43,424

Chief Exports (Domestic Produce).

		1913.	1921.
Sugar	Tons	9,910	26,345
	£	90,671	515,187
Molasses	Gallons	9,086,000	4,191,471
	£	376,610	403,927

BRITISH GUIANA

Area, 89,480 square miles. Population (1921), 298,188 (124,900 immigrants from India). The rich alluvial soil of the coastal plain is well suited to the cultivation of various crops, of which sugar cane and rice are the most important, and take a leading place in the exports. The remarks made elsewhere (p. 93) on the sugar industry apply with equal force here. The total acreages for sugar cane, rice, and coconuts in 1921 were 69,532, 55,911, and 26,321. The cultivation of rice is making great advances, and the production not only meets local demands, but also a large proportion of those of the West Indies and French and Dutch Guiana. Provision crops of various kinds (plantains, cassava, maize, yams, sweet potatoes, etc.), are grown for local consumption. There are thirty-nine sugar estates with a total acreage of 166,519 (sugar cane, 65,869; rice, etc., 19,546; the remainder pasture or uncultivated).

Chief Imports.

		1913.	1921.
Grain and pulse	Tons	5,040	3,869
	£	46,913	77,838
Flour	Barrels	162,653	160,321
	£	154,926	304,326
Vegetables, fresh	£	36,030	81,126
Malt liquors	£	29,744	23,638

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Rice	Tons	7,710	2,027
	£	106,155	59,132
Sugar	Tons	87,414	108,270
	£	1,102,670	2,104,144
Molasses	Gallons	118,699	204
	£	5,199	7
Coconuts	Thousands	876	2,761
	£	3,166	10,471
Rum	Gallons	3,260,986	2,228,164
	£	204,140	364,231

BRITISH HONDURAS

This tropical Central American colony has an area of about 8,598 square miles, and the population in 1921 was 45,317. Though chiefly notable for forestry products, an acreage of about 60,000 is under cultivation, and the chief crops are as follows:

	1913.		1917.	
	Acreage.	*Production.*	*Acreage.*	*Production.*
Maize	6,900	—	6,400	—
Rice	50	—	200	—
Sugar cane	860	raw sugar, 759 tons rum, 64,924 gals.	835	raw sugar, 759 tons rum, 42,945 gals.
Pasture	11,600	—	11,600	—
Bananas	1,200	485,000 (bunches)	1,200	5,000 (bunches)
Coconuts	1,000	8,000 (number)	1,000	8,000 (number)

CHIEF IMPORTS.

	1913.	1921.
Rice	£9,524	£15,788
Flour	21,900	43,539
Provisions (including drink)	39,606	9,105

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Bananas	Bunches	617,537	462,898
	£	30,323	33,361
Coconuts	Thousands	5,893	7,262
	£	31,793	29,305

FALKLAND ISLANDS

Area, 6,500 square miles. Population (1921), 2,094. The staple industry is sheep-farming, and there is no surplus of vegetable products for export. The dependencies of the Falklands include South Georgia (area, 1,000 square miles), South Shetlands, South Orkneys, Sandwich Group (not to be confounded with the Pacific Islands of the same name), and Graham's Land in Antarctica.

Chief imports: groceries, 1913, £31,405; 1921, £61,171.

AUSTRALASIA

AUSTRALIA

The area of the island continent is 2,974,581 square miles—nearly a quarter of the total area of the British Empire—of which 0·386 is in the tropical zone, so that the products are of extremely varied character. About two-thirds of this area has a mean annual rainfall of under 20 inches, and is consequently unsuited for ordinary farming, but a great deal of it could be made so by irrigation, which has already been carried out on a considerable scale. It only needs capital and man-power to do much more in this direction.

The development problems of the Commonwealth mainly hinge on its great size and the sparseness of its population, which on December 31, 1921, totalled 5,510,229, being only 1·87 per square mile, as against a world-density of 35·52. The density figure of 388·94 for the 47 millions of the United Kingdom affords a striking contrast, and suggests the urgent necessity for further redistribution of the Imperial population.

The acreage under crops (including artificially sown grasses) during 1913-14 was 17,891,374, and during 1920-21 was 15,069,858, marking the arrest of a persistent downward movement in the extent of the area cultivated. There is also a vast extent of natural pasturage, and the recent discoveries in the Northern Territory show that this is greater than was formerly supposed.

I.—Grain Crops and Products.

1. Wheat:

Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons). (U.K. Best Customer.)*
1913–14.			1913.	1913.
9,287,398	2,768,146·4 (£18,769,017)	11·13 (£2 0s. 5d.)	1·6 (£15)	1,149,720·2 (£7,987,477)
1920–21.			1922.	1922.
9,072,167	3,907,335·3 (£62,169,360)	13·58 (£6 17s. 1d.)	6·6 (£51)	2,677,157·7 (£28,644,155)

Taking the average of the ten years 1909-18 (as calculated by the Institute of Agriculture at Rome), Australia produced 2·7 per cent. of the world yield, while the total production of the Empire amounted to 20·82 per cent. It follows that for the period mentioned Australia accounted for 13·1 per cent. of the total Empire yield.

There is no finer wheat in the world than that of Australia, but the yield per acre has so far been comparatively small, and prolonged periods of drought resulted in five complete failures of the crop during the twenty years ending 1917, and for four of these the supply had to be supplemented by imports. Breaking up of land on a large scale has been known to have an ameliorating influence on climate, and ultimately this may turn out to be the case in Australia.

EXPORT VALUES OF AUSTRALIAN WHEAT, 1916–17 TO 1920–21.

	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Price per bushel ..	4 10	5 3	5 1	5 6	9 0

The export values here shown are the average declared values for the successive years at the several ports of shipment in the Commonwealth.

Owing to the abnormal conditions caused by the War a Wheat Marketing Scheme was brought into operation for dealing with the exportable surplus of the 1915-16 harvest, for the purpose of securing equitable division of proceeds among all growers and allotting freights. An Australian Wheat Board fixed prices and made all necessary arrangements. Advances were made to farmers on delivery of their grain. These methods were continued for the harvests of the five subsequent cereal years. (For details, see *Official Year Book for* 1922, pp. 251-254). The policy then adopted is explained in the following quotation (*op. cit.*, pp. 1097, 1098):

" The termination of the Australian Wheat Marketing Scheme in 1921 necessitated the creation of new machinery for the disposal of the 1921-22 harvest. The time was not considered opportune for a complete return to pre-war selling conditions, and Voluntary Pools, controlled by Committees appointed by the growers, were established in New South Wales, Victoria, and South Australia. The marketing of the Western Australian wheat was conducted by a Compulsory Government Pool, administered by the Minister for Agriculture, who had the assistance of an Advisory Committee and of a wheat expert as general manager.

" The quantities of wheat received by the different Pools were as follows:

Particulars.	*Unit.*	*N.S.W.*	*Victoria.*	*South Australia.*	*West Australia.*
Wheat received	Bushels	22,784,329	32,100,000	7,842,788	11,788,162
Percentage of marketable wheat	Per cent.	58	78	36	96

" Advances were made to the growers on delivery of their wheat to the Pools, and the usual certificates were issued entitling holders to further payments when

finance could be arranged. The amounts so advanced in the various States up to the end of August, 1922, were as below:

	s.	d.	
New South Wales	4	6	less rail freight.
Victoria	4	4	„ „
South Australia	4	6	„ „
Western Australia	4	10	„ „

" Arrangements are being completed for a further payment of 5d. per bushel by the South Australian Pool in September, and of 6d. per bushel by the Victorian Pool in October; while it is anticipated that final payments amounting to 7d. and 5½d. will eventually be made by the New South Wales and Western Australian Pools respectively, which will give an average return to the farmers in these two States of 4s. 8d. and 4s. 10d. per bushel at country railway stations.

" The local and oversea sales of wheat effected by the Pools to date realized the following average prices per bushel:

	s.	d.
New South Wales	5	5·50
Victoria	5	4·14
South Australia	5	4·06
Western Australia	5	5·00

Wheat flour (50 bushels wheat = 1 ton flour).

	Imports (Tons).	*Exports (Tons).* (*Mostly Empire.*)
1913	47·6 (£452)	197,908·5 (£1,863,667)
1921–22	32·2 (£652)	321,190·7 (£5,519,881)

Macaroni and Vermicelli:

	Imports (Tons). (*Chiefly Foreign.*)	*Exports (Tons).* (*Mostly Empire.*)
1913–14	246·9 (£6,893)	81·7 (£2,458)
1921–22	103·7 (£5,954)	130·4 (£6,597)

Bran, Pollard, and Sharps:

	Imports (Tons). (*Chiefly Foreign.*)	*Exports (Tons).* (*Mostly Empire.*)
1913–14	417·7 (£1,998)	12,028·9 (£68,676)
1921–22	0·7 (£6)	5,186·9 (£56,813)

2. BARLEY:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).* (*Mostly Foreign.*)
1913–14.					
Malting ..	151,944	58,603·0	17·28	50·1 (£6,026)	165·5 (£1,069)
Other ..	70,620	2,896·4	18·34		
1921–22.					
Malting ..	—	—	—	157·4 (£1,891)	43,210·5 (£396,883)
Other ..	—	—	—		

As regards yield per acre the Commonwealth occupies the same relative place (sixteenth) as in the case of wheat.

It will be seen that barley is cultivated on a sufficiently large scale to give a surplus for export. The same is true for the products. *Pearl and Scotch barley* were imported and exported as follows for 1921-22: imports, 10·5 tons (£381), exports, 138·9 tons (£3,128). Malt will be dealt with under Potable Alcohol.

3. OATS :

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Mostly N.Z.)*	*Exports (Tons). (Mostly Foreign.)*
1913–14 ..	859,020	272,000·8	17·73	2,608·9 (£20,282)	—
1921–22 ..	—	—	—	265·7 (£2,569)	5,817·7 (£49,980)

Oats are the second Australian crop in respect of acreage and yield. They occupy about 6 per cent. of the cropped area, as against the 60 per cent. of wheat. The average yield per acre (1920) was less than that of Canada (28·5), and much less than that of the United Kingdom (39·1), but considerably greater than that of South Africa (11·0).

Oatmeal, Rolled Oats, etc. (wheat-meal is included here in the Australian statistics):

	Imports (Tons). (Mostly U.S.A.)	*Exports (Tons). (Mostly Empire.)*
1913–14	359·4 (£10,124)	303·4 (£3,201)
1921–22	48·3 (£2,393)	171·0 (£5,589)

4. RYE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*
1913–14	9,559	3,031·6	11·84
1919–20	3,663	869·8	8·86

This cereal occupies a subordinate position. The greater part is raised in N.S.W. and Victoria.

5. MAIZE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Mostly S. Africa.)*	*Exports (Tons). (Nearly all Empire.)*
1913–14 ..	331,879	50,761·6	27·64	6,828·0 (£53,387)	381·5 (£3,349)
1921–22 ..	—	—	—	1,126·6 (£9,791)	907·9 (£9,023)

Maize, at present, is a minor Australian crop. The yield per acre is satisfactory in comparison with that of other maize-growing countries.

Maize Products (cornflour, etc.):

	Imports (Tons).	*Exports (Tons).*
1913–14	206·2 (£7,120)	5·6 (£204)
1921–22	349·7 (£9,375)	27·5 (£1,390)

The exports of cornflour have shown an increase of late years, and indicate a promising direction in which extension of trade is possible.

6. RICE:

The Commonwealth is quite undeveloped as a rice-growing country, but small areas are under cultivation in Queensland and the Northern Territory, though the results are not very satisfactory. It is believed that large areas in the two above States, and in Western Australia, are well suited to this crop.

	Imports (Tons). (Largely Empire.)	*Exports (Tons). (Mostly Empire.)*
1913–14	32,476·7 (£322,572)	6,076·6 (£84,910)
1921–22	27,611·6 (£420,212)	6,440·5 (£193,146)

Rice-Meal and Flour :

	Imports (Tons). (Mostly China.)	*Exports (Tons). (Mostly N.Z.)*
1913–14	12·8 (£304)	2,126·3 (10,738)
1921–22	5·7 (£220)	3,280·0 (£2,230)

7. UNSPECIFIED GRAIN:

	Imports (Tons). (Mostly N.Z.)	*Exports (Tons).*
1913–14	544·1 (£7,001)	15·0 (£222)
1921–22	125·3 (£3,493)	4·4 (£79)

8. PREPARED GRAIN, VARIOUS:

	Imports (Tons).	*Exports (Tons). (Mostly Empire.)*
1913–14	244·3 (£6,186)	61·1 (£1,307)
1921–22	89·0 (£4,300)	44·9 (£2,409)

II.—ROOT CROPS.

1. TURNIPS, MANGELS, SWEET POTATOES (Queensland), 1919-20:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
Turnips	3,521	13,547	3·85
Mangels	1,277	12,530	9·81
Sweet potatoes ..	1,391	4,600	3·31

2. POTATOES:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Imports (Tons)*	*Exports (Tons). (Mostly Foreign.)*
1913–14 ..	128,889	431,141	2·53	996·1 (£5,537)	1,689·0 (£12,012)
1921–22 ..	—	—	—	59 (£499)	2,540 (£21,611)

3. ARROWROOT :

	Imports (Tons).	*Exports (Tons).*	*Production (Tons).*
1913–14 ..	4·8 (£230)	10·1 (£318)	—
1921–22 ..	0·8 (£95)	43·5 (£1,691)	5,102 (1919–20)

Invert Sugar, etc.—Imports: 1913-14, 11·7 tons (£189); 1921-22, 11·8 tons (£413).

Golden Syrup, etc.:

	Imports (Tons).	*Exports (Tons). (Empire.)*
1913–14	40·4 (£1,038)	18·0 (£305)
1921–22	2·5 (£143)	8·0 (£290)

Other Cane Sugar Products:

	Imports (Tons).	*Exports (Tons).*
1913–14	39·7 (£774)	—
1921–22	11·9 (£325)	2·0 (£97)

VII.—Fruit.

A complete treatise would be required to give an adequate idea of this important and growing industry, which is capable of indefinite extension. Some notion of the relative position occupied by different kinds of fruit (not including grapes) may be gathered from the following table, giving acreages, total yields, and total crop values for 1920-21. Imports and exports for 1913-14 and 1921-22 are then stated in summary form, as in the official Commonwealth statistics.

	Acreage.	*Bushels.*	*Value.*
Apples	79,917	5,870,471	£1,750,531
Pears	15,957	1,450,219	356,569
Plums	10,701	773,836	207,467
Nectarines and peaches ..	25,155	1,921,844	702,891
Apricots	10,232	690,827	278,637
Oranges	30,881	2,582,867	1,045,642
Lemons	4,918	464,572	160,354
Bananas	12,908	1,403,347	649,996
Pineapples	3,934	832,033 doz.	291,393
Other fruits	19,935	—	563,981
Total	214,538		6,007,461

1. Fresh Fruit:

Apples:	*Imports (Tons). (Mostly U.S.A.)*	*Exports (Tons). (Mostly to U.K.)*
1913–14	2,692·4 (£68,146)	22,014·2 (£325,600)
1921–22	—	37,433·4 (£803,286)

Citrus fruit:	*(Mostly Foreign.)*	*(Mostly N.Z.)*
1913–14	Included in Other Fresh Fruits	1,295·2 (£22,865)
1921–22	223·4 (£8,895)	2,655·4 (£79,754)

V.—Forage Crops.

Mostly cereals and lucerne, chiefly grown in connection with the dairying industry.

	Acreage Harvested.	*Total Value.*	*Value per Acre.*
1913–14	486,504	£1,594,834	£3 5s. 7d.
1919–20	1,401,237	£2,627,051	£1 17s. 6d.

VI.—Sugar Crops.

1. Sugar Beet and Beet Sugar.—Efforts are being made to revive the sugar beet industry in Victoria, and an irrigation scheme is in progress by which large areas will be made suitable for cultivation. A fine grade of white sugar is manufactured, and the residues are distributed for stock-feeding.

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1919–20	1,090	13,195	12·11

2. Sugar Cane.—For sugar-making purposes this is only grown in Queensland and N.S.W., more extensively in the former State, though the average yield per acre is much higher in the latter.

	Acreage.		*Total Yield (Tons).*	*Yield per Acre (Tons).*
	Productive.	*Unproductive.*		
1913–14 ..	94,661	79,340	2,271,558 (£2,575,386)	20·84 (£16 0s. 9d.)
1919–20 ..	89,704	69,333	1,350,081 (£2,505,932)	15·05 (£15 15s. 2d.)

Cane Sugar :

	Production (Tons).	*Imports (Tons). (Mostly Fiji.)*	*Exports (Tons). (Mostly Pacific.)*
1913–14 ..	173,296 (1911)	1,497,230 (£864,768)	3,419 (£54,322)
1921–22 ..	167,401 (1920)	6,888 (£174,850)	1,918 (£60,145)

Although at present Australia imports on a large scale, there is no reason why she should not ultimately occupy a prominent place among sugar-exporting countries. It should also be noted that a considerable part of her requirements are supplied by another part of the Empire—Fiji.

Molasses.—6,451,192 gallons were produced in 1911 in the Australian sugar mills, and 6,175,867 in 1922. Part of this product is used for distillation, part is prepared for human consumption, part is converted into stock-food, and a certain proportion is employed as manure, while a not inconsiderable quantity is allowed to run to waste.

Glucose :

	Imports (Tons). (Foreign.)	*Exports (Tons). (Empire.)*
1913–14	4,090·5 (£51,958)	15·7 (£240)
1921–22	449·7 (£8,258)	7·0 (£240)

III.—Pulse Crops.

Peas and Beans:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Chiefly N.Z.)*	*Exports (Tons). (Nearly all Empire.)*
1913–14 ..	38,839	17,357·4 (£144,296)	16·68	1,345·9 (£19,242)	283·8 (£4,202)
1921–22 ..	—	—	—	791·7 (£22,234)	7,683·9 (£137,800)

IV.—Grass Crops.

1. Artificially Sown Grasses.—These are mostly sown on uncultivated land after burning off the existing vegetation. The acreages of permanent grass were as follows: 1913-14, 3,208,362; 1919-20, 3,758,120.

2. Hay.—After wheat this is the most important Commonwealth crop, and occupied in 1920-21, 21·45 per cent. of the cultivated area. Its expansion is related to the increasing development of the meat trade and the dairy industry.

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Imports. Hay and Chaff (Tons).*	*Exports. Hay and Chaff (Tons).*
1913–14 ..	2,754,672	3,372,596	1·22	67·9 (£291)	13,021·5 (£53,657)
1921–22 ..	—	—	—	66 (£533)	3,491 (£21,354)

It should be noted that while in European countries the hay crop mostly consists of grasses and the associated clovers, etc., a very large proportion of Australian hay consists of cereals, particularly wheat and oats, while a large quantity of lucerne (alfalfa) hay is also made.

The Commonwealth hay crop for the season 1915-16 was the highest on record, and amounted to 5,633,988 tons. The second in importance was 4,686,366 tons for the season 1920-21, while the third was 3,955,311 tons for 1912-13.

Considering the bulky nature of the commodity any very large increase in the export trade can hardly be anticipated.

3. Seed Grass, Clover, etc.:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*
1913–14	3,669	340·0 (£14,285)	9·87
1919–20	6,765	583·4 (£34,896)	8·84

4. Ensilage.—Dairy farmers and sheep-breeders are beginning to realize the importance of this feeding-stuff, and the Government of Victoria not only provides instruction, but also erects silos on liberal terms, repayment extending over a series of years. The Government of N.S.W. also provides instruction, gives advice, and arranges for demonstrations on experimental farms, but does not extend financial aid.

In 1920-21 the output was 35,431 tons, valued at £62,820.

1. FRESH FRUIT—*Continued :*

Bananas:	*(Mostly Fiji.)*	
1913–14	16,407·6 (£241,137)	—
1921–22	830·8 (£20,797)	222·6 (£6,457)
Pineapples:	*(Mostly Foreign.)*	*(Nearly all N.Z.)*
1913–14	0·6 (£14)	293·0 (£3,980)
1921–22	0·6 (£13)	287·5 (£6,199)
Other fresh fruit:		*(Mostly U.K.)*
1913–14	113·3 (£2,560)	2,483·3 (£47,355)
1921–22	10·1 (£202)	2,857·4 (£78,030)

2. DRIED FRUITS :

	Imports (Tons).	*Exports (Tons).*
Currants:	*(Mostly Foreign.)*	*(Mostly Empire.)*
1913–14	36·4 (£1,033)	210·8 (£5,122)
1921–22	1·59 (£102)	4,884·4 (£344,238)
Raisins:	*(Foreign.)*	*(Mostly Empire.)*
1913–14	84·6 (£4,837)	856·4 (£25,365)
1921–22	97·9 (£12,021)	589·5 (£550,838)
Dates:	*(Nearly all Foreign.)*	*(Mostly Empire.)*
1913–14	1,019·2 (£61,048)	17·5 (£396)
1921–22	2,183·8 (£83,640)	85·6 (£2,060)
Other dried fruits:	*(Mostly Foreign.)*	*(U.K. Best Customer.)*
1913–14	1,019·2 (£45,521)	21·8 (£1,216)
1921–22	410·5 (£36,549)	721·6 (£72,321)

3. JAMS AND JELLIES.

	Imports (Tons).	*Exports (Tons).*
	(Mostly U.K.)	*(Mostly Empire.)*
1913–14	202·2 (£12,213)	829·6 (£29,402)
1921–22	29 7 (£3,765)	2,518·1 (£164,046)

4. PEEL:

	Imports (Tons).	*Exports (Tons).*
	(Largely British.)	
1913–14	473·1 (£6,202)	17·9 (£211)
1921–22	29·0 (£1,883)	37·9 (£2,162)

5. FRUIT JUICES AND SYRUPS (non-alcoholic, and including unfermented wine).

	Imports (Gallons.)	*Exports (Gallons).*
	(Nearly all Empire.)	*(Largely Foreign.)*
1913–14	59,639 (£10,921)	15,729 (£3,745)
1921–22	21,969 (£4,961)	73,683 (£28,082)

6. PRESERVED FRUIT AND VEGETABLES (other than dried):

	1913–14.	1921–22.
Value of imports (mostly foreign)	£50,740	£47,998
Value of exports (mostly U.K.) (including pulped fruit)	£23,069	£1,024,957

VIII.—EDIBLE NUTS.

1. ALMONDS:

	Imports (Tons). (*Mostly Foreign.*)	*Exports (Tons).* (*Empire.*)
1913–14	206·4 (£31,169)	2·4 (£303)
1921–22	361·4 (£57,916)	27·0 (£294)

2. OTHER NUTS:

	Imports (Tons).	*Exports (Tons).* (*Mostly N.Z.*)
1913–14	2,352·0 (£72,388)	40·9 (£1,318)
1921–22	4,450·7 (£220,827)	93·4 (£5,603)

IX.—VEGETABLES.

1. MARKET GARDENS:

	Acreage.	*Total Yield.*	*Yield per Acre.*
1913–14	29,940	£985,073	£32 18s. 2d.
1920–21	28,260	—	—

2. ONIONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	6,932	28,455 (£179,389)	4·10 (£25 17s. 7d.)
1920–21	9,061	49,088·0 (£183,946)	5·42 (£20 6s. 2d.)

3. PUMPKINS AND MELONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	13,992	£147,096	£10 10s. 3d.

4. DRIED OR CONCENTRATED VEGETABLES:

	Value (1913–14).	*Value* (1921–22).
Imports (mostly foreign) ..	£8,355	£7,782
Exports (mostly Empire) ..	£427	£343

5. VEGETABLES (unspecified):

	Imports (Tons). (Mostly Foreign.)	Exports (Tons). (Mostly Empire.)
1913–14	160·9 (£1,882)	101·2 (£1,715)
1921–22	80·9 (£1,858)	151·5 (£3,310)

6. SPLIT PEAS:

	Imports (Tons).	Exports (Tons).
1913–14	4·1 (£64)	6·8 (£145)
1921–22	0·2 (£12)	51·8 (£1,561)

7. PRESERVED VEGETABLES (other than dried) included with Preserved Fruits.

X.—MISCELLANEOUS.

1. BISCUITS:

	Imports (Tons). (Mostly Empire.)	Exports (Tons). (Mostly Empire.)
1913–14	216·7 (£17,238)	2,793·0 (£81,798)
1921–22	13·7 (£2,519)	2,289·4 (£173,755)

2. CONFECTIONERY (including caramel, etc., and cocoa butter):

	Imports (Tons).	Exports (Tons). (Mostly Empire.)
1913–14	4,210·3 (£482,911)	210·0 (£128)
1921–22	1,045·2 (£195,595)	485·6 (£79,132)

3. SAGO AND TAPIOCA:

	Imports (Tons). (Greater part Empire.)	Exports (Tons). (Mostly Empire.)
1913–14	4,371·6 (£57,592)	30·6 (£504)
1921–22	4,265·4 (£83,329)	120·9 (£3,104)

4. INFANTS' AND INVALIDS' FOOD.—In 1921-22 the imports were valued at £33,1913, and the exports at £228,790.

5. MALT EXTRACT:

	Imports (Tons).	Exports (Tons). (New Zealand.)
1913–14	32·7 (£1,390)	13·5 (£1,512)
1921–22	16·3 (£1,482)	13·8 (£1,759)

6. OLIVE OIL:

	Imports (Gallons). (Mostly Foreign.)	Exports (Gallons). (Mostly N.Z.)
1913–14	59,221 (£19,304)	1,859 (£751)
1921–22	33,826 (£17,901)	3,327 (£2,754)

7. OILCAKE:

	Imports (*Tons*).	*Exports* (*Tons*). (*Mostly U.K.*)
1913–14	31·0 (£273)	144·1 (£2,233)
1921–22	14·6 (£209)	6,849·6 (£78,179)

8. AERATED AND MINERAL WATERS:

	Value (1913–14).	*Value* (1921–22).
Imports	£14,214	£715
Exports (mostly Empire)	£2,072	£7,992

9. VINEGAR:

	Imports (*Gallons*). (*Mostly U.K.*)	*Exports* (*Gallons*). (*Mostly Empire.*)
1921–22	62,230 (£19,108)	8,008 (£1,107)

XI.—POTABLE ALCOHOL.

1. SPIRITS.

Distilleries.—In 1920-21 there were 37 distilleries, of which the output (in gallons) was: brandy, 237,746; gin, 52,804; whisky, 202,090; rum, 61,152; other spirits (including Queensland rum), 1,946,178.

	Imports (*Gallons*). (*Mostly Foreign.*)	*Exports* (*Gallons*). (*Mostly Empire.*)
Brandy:		
1913–14	325,657 (£192,246)	3,506 (£2,286)
1921–22	87,771 (£105,656)	2,850 (£4,569
	(*Nearly all U.K. and Canada.*)	(*Mostly Empire.*)
Whisky:		
1913–14	2,251,914 (£771,415)	31,240 (£16,332)
1921–22	861,941 (£1,141,397)	60,177 (£89,231)
	(*Mostly U.K.*)	(*Mostly Empire.*)
Gin:		
1913–14	606,079 (£167,495)	3,849 (£1,192)
1921–22	142,303 (£84,312)	2,617 (£2,972)
	(*Mostly Empire.*)	(*Mostly Empire.*)
Rum:		
1913–14	324,573 (£61,990)	2,657 (£409)
1921–22	21,595 (£16,196)	5,040 (£1,726)
		(*Mostly Empire.*)
Unspecified spirit:		
1913–14	62,772 (£32,876)	187,917 (£14,225)
1921–22	35,139 (£33,944)	1,736 (£2,847)

2. ALE AND STOUT.

Breweries.—In 1920-21 there were 67 breweries, of which the output (in gallons) was 70,235,740, valued at £6,927,782.

Malt:	*Production (Bushels and £).*	*Imports (Tons).*	*Exports (Tons). (Mostly S. Africa and N.Z.)*
1913–14 ..	2,798,414, value	1,517·9 (£31,071)	2·1 (£55)
1921–22 ..	£1,176,903 in 1919–20	0·7 (£43)	134·8 (£3,238)

Hops:	*Acreage.*	*Total Yield (Tons).*	*Yield per Acre (Tons).*	*Imports (Tons).*	*Exports (Tons).*
1913–14	1,473	744·5 (£90,509)	0·5 (£61 8s. 11d.)	674·3 (£92,602)	3·2 (£452)
1921–22	—	—	—	33·6 (£77,646)	4·1 (£822)

Ale and stout:	*Imports (Gallons). (Mostly U.K.)*	*Exports (Gallons). (Mostly Empire.)*
1913–14	3,481,960 (£547,238)	39,837 (£6,484)
1921–22	321,090 (£146,143)	237,095 (£77,691)

3. CIDER AND PERRY:

	Imports (Gallons).	*Exports (Gallons).*
1913–14	3,133 (£628)	342 (£85)
1921–22	130 (£123)	982 (£352)

4. WINE:

Vineyards:	*Total Acreage.* *Productive.*	*Unproductive.*	*Productive Acreage for Wine.*	*Yield Wine Grapes (Tons).*
1913–14	50,765	10,432	—	33,707 (£460,692)
1920–21	63,418	17,747	35,208	—

Wine:	*Wine Made (Gallons).*	*Imports (Gallons). (Mostly Foreign.)*	*Exports (Gallons). (Mostly Empire.)*
1913–14	4,709,891	144,740 (£171,876)	702,322 (£105,809)
1921–22	7,649,404 (1919–20)	40,605 (£31,474)	604,558 (£160,357)

Miscellaneous wine (non-grape):	*Imports (Gallons).*	*Exports (Gallons).*
1913–14	5,173 (£1,484)	318 (£221)
1921–22	2,118 (£2,035)	472 (£581)

PAPUA

This Australian Dependency, the southern part of East New Guinea, has an area of 90,540 square miles. The white population in 1921 was 1,264, and the coloured non-Papuan population 577. The estimated number of natives was 250,000.

The climate is favourable to agriculture, and the rainfall is abundant and evenly distributed, and almost every kind of tropical product can be successfully cultivated. The chief plantation industries, at present, are coconut, rubber, and sisal hemp, while food crops (rice, maize, cassava, various fruits) are of minor importance, and have to be supplemented by imports. Some of the more valuable indigenous food plants are sugar cane, banana, bread-fruit, and sago palm, together with edible nuts and different kinds of fruit and vegetables.

CHIEF IMPORTS.

	1913.	1921.
Agricultural products and groceries	£72,447	£125,716
Ale, spirits, and beverages	£6,888	£14,550

NORFOLK ISLAND

This Australian Dependency has an area of 13·3 square miles, and the population in 1921 was 717. The soil is very fertile and various subtropical fruits are cultivated, including oranges, bananas, passion-fruits and pineapples. Thousands of lemon trees and guavas grow wild, and the most important exports are preserved lemon peel and lemon juice.

NEW ZEALAND

Total area, 103,861 square miles, of which 577 are accounted for by " outlying " and annexed Pacific islands. The Dominion " proper " has consequently an area of 103,284 square miles. Excluding annexed islands the total acreage is given at 66,292,232, of which barren and worthless land takes up an estimated acreage of 2,530,917—a very small proportion considering the mountainous character of the Dominion. On January 31, 1922, 43,528,337 acres were returned as being in occupation, including reserves and native lands leased, but excluding areas within borough boundaries, holdings of less than one acre in extent, and native land held on the communal system. Of this occupied land 2,016,081 acres were barren and unproductive.

The total population of New Zealand in 1921 was 1,284,873, corresponding to a density of 12·37 per square mile, and representing much closer settlement than in the vast Dominion of Australia, for which the corresponding figure is only 1·87. There is some tendency towards rural depopulation, for an " urban drift " that began in 1906 would appear to be gaining in momentum.

Since the Dominion proper is entirely within the south temperate zone we naturally find an absence of the tropical products distinctive for large areas in Australia and—broadly speaking—the agriculture is comparable to that of the United Kingdom. The Cook Islands and some others are in the tropical zone, so that the Dominion possesses a special source of tropical produce.

Agricultural exports are steadily diminishing, and New Zealand appears to

be well on the way to reduce her agriculture to a level barely sufficient to supply her own plant food-stuffs, except in years of exceptionally high yield. Pastoral exports, on the other hand, are steadily increasing.

I.—Grain Crops and Products.

1. Wheat:

	Acreage.	Total Yield (Tons).	Yield per Acre (Bushels).	1913 and 1921. Imports (Tons).	Exports (Tons).
1913–14 ..	166,774	140,134·8	31·37	121,737	—
1921–22 ..	352,918	282,998·4	29·94	306,257	12·3 (£251)

The large acreage for the latter year was not the result of normal increase in wheat production, but was due to special causes, more particularly to the chaotic state of the wool market in 1921 and the uncertainty that then obtained in the dairy industry with reference to the disposal of products. Under the circumstances farmers regarded wheat-growing as a safer proposition.

As compared with other countries New Zealand takes a high place as regards yield per acre, and this is largely due to the fertility of the soil, for cultivation is less intensive than in the case of closely settled European countries.

Dominion Requirements.—It is estimated that the annual consumption amounts to 7,250,000 bushels, of which 6,600,000 are milled (5 bushels per head of the population), 400,000 used for seed, and 250,000 fed to poultry.

Wheat Flour :

	Imports (Tons). (Australia and Canada.)	Exports (Tons).
1913	2,658·2 (£26,554)	260 (£2,200)
1921	117·0 (£2,574)	113·3 (£2,838)

Macaroni and Vermicelli :

	Imports (Tons). (Australia and Canada).	Exports (Tons).
1913	141·6 (£4,282)	—
1921	126·1 (£7,400)	242 lbs. (£9)

Bran, Pollard, and Sharps :

	Imports (Tons). (Australia and Canada.)	Exports (Tons).
1913	760·4 (£3,767)	1,944·0 (£8,097)
1921	62·5 (£500)	123·6 (£1,373)

2. Barley:

	Acreage.	Total Yield (Tons).	Yield per Acre (Bushels.)	Imports (Tons).	Exports (Tons).
1913–14 ..	32,022	26,911·3	37·65	100 lbs. (£1)	105·9 (£959)
1921–22 ..	33,078	25,698·9	34·80	53·9 (£839)	836·1 (£9,477)

Pearl Barley.—Imports: 1913, 76·7 tons (£1,117); 1921, 42·9 tons (£857). Exports: 1913, nil; 1921, 0·25 tons (£10).

3. OATS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons). (Mostly Australia).*	*Exports (Tons). (Mostly U.K.)*
1913–14 ..	361,741	263,231·1	40·75	30·8 (£387)	4,272·6 (£29,252)
1921–22 ..	170,655	117,568·7	39·56	1,048 (£12,002)	7,704·9 (£84,434)

Oatmeal, Rolled Oats, etc. (including wheat-meal in 1921 exports).—Imports: 1913, 2 tons (£51); 1921, 706·3 tons (£835). Exports: 1913, 10·8 tons (£184); 1921, 14·9 tons (£477).

4. RYE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1921–22 ..	1,233	807·5	24·45	—	113·8 (£728)

5. MAIZE:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1921–22 ..	10,522	12,011·3	46·42	1,961·3 (£22,615)	2·7 (£47)

Maizena, Cornflour, etc.:

	Imports (Tons).	*Exports (Tons).*
1913	850·5 (£22,693)	2·0 (£77)
1921	388·6 (£21,884)	1·6 (£106)

6. RICE.—Imports: 1913, 2,955 tons (£42,396); 1921, 2,962·4 tons (£71,352). Exports: 1913, 68 tons (£1,121); 1921, 34·1 tons (£1,441).

Rice-Meal, etc.—Imports: 1,035·5 tons (£4,808) in 1913, and 348·8 tons (£2,324) in 1921.

7. UNSPECIFIED GRAIN (mostly Empire).—Imports (less re-exports) to value of £14,683 in 1913, and £14,828 in 1921.

8. VARIOUS PREPARED CEREALS (mostly Empire).—Imports (less re-exports) to value of £8,849 in 1913, and £5,082 in 1921.

II.—ROOT CROPS.

	Turnips.	*Mangels.*	*Potatoes.*
1913–14:			
Acreage	493,568	10,182	29,164
Total yield (tons)	—	—	157,194
Yield per acre (tons)	—	—	5·39
1921–22:			
Acreage	508,520	10,063	19,418
Total yield (tons)	—	—	112,090
Yield per acre (tons)	—	—	5·80

Imports of potatoes: 1913, 28 tons (£264); 1921, 155 tons (£1,541). Exports of potatoes: 1913, 1,556 tons (£7,443); 1921, 1,216 tons (£9,113).

Other root crops are of minor importance. In 1921-22 the acreage under carrots was 1,816, and that under sweet potatoes (kumeras) 145. The latter are imported from the Cook Islands.

ARROWROOT.—Imports (mostly Australia and Fiji), 16 tons (£556) in 1913, and 24·1 tons (£1,421) in 1921. Exports, 0·42 tons (£14) in 1913, and 0·28 tons (£21) in 1921.

III.—PULSE CROPS.

PEAS AND BEANS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Bushels).*	*Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	241·1 (£5,971)	9,115·8 (£89,297)
1921–22 ..	12,789	9,091·0	26·53	92·7 (£4,937)	155·1 (£2,260)

Split Peas.—Imports: 1913, 71·8 tons (£894); 1921, 19·5 tons (£562). Exports: 1913, nil; 1921, 6 tons (£215).

IV.—GRASS CROPS

1. NATURAL PASTURE.—The acreage for the occupied holdings was 23,972,236 in 1910-11, and 14,609,603 in 1921-22.

2. ARTIFICIALLY SOWN GRASSES.—In correlation with the importance of the grazing industry sown grass land heads the list of cultivations. Given sufficient light and moisture, English grasses flourish on land from which bush and fern have been removed. Stock can be wintered on the pastures, for the mildness of the climate secures outdoor keep even during the coldest months of the year. The grazing acreage of sown grass land amounted to 15,925,235 in 1921-22.

Hay:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1921–22	187,363	6,470	—

3. SEED GRASSES AND CLOVERS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
1913–14	81,871	12,023·72	—
1921–22	91,134	12,134·17	—

4. ENSILAGE.—During the season 1921-22, 1,039 acres of maize were grown for this purpose, and the yield was 6,470 tons. Figures for 1913-14 are not available.

5. CHAFF, ETC.—During 1921-22 considerable acreages of cereals were grown for the production of chaff, hay, or ensilage, as follows:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*
Wheat	1,252	2,443	1·96
Oats	344,051	538,194	1·56
Barley	793	1,469	1·85

Figures for 1913-14 not available.

V.—FORAGE CROPS.

During 1921-22, 201,351 acres of cereals and grasses were grown for the production of green fodder. Complete figures for 1913-14 not available, but 220,911 acres were under rape.

VI.—SUGAR CROPS.

The beet sugar industry is not developed, so that sugar and sugar products have to be imported, the particulars being as follows:

1. SUGAR (less re-exports)—mostly Empire, especially Fiji—60,767 tons (£787,631) in 1913, and 62,759·6 tons (£2,014,481) in 1921-22.

2. GLUCOSE (mostly U.S.A.)—708·7 tons (£9,186) in 1913, and 973·9 tons (£20,323) in 1921.

3. MOLASSES.—2,372·6 tons (£3,588) in 1913, and 103·8 tons (£266) in 1921.

4. CARAMEL (mostly Empire).—25·7 tons (£792) in 1913, and 22·1 tons in 1921.

VII.—FRUIT.

The Dominion proper produces a considerable quantity of the chief fruits characteristic of temperate climates, together with a moderate amount of citrus fruit. Bananas, pineapples, etc., are grown in the Cook Islands. The orchard acreages of New Zealand were as follows:

	Private Orchards.	*Commercial Orchards.*		*Total.*
		Not Bearing.	*Bearing.*	
1921–22	5,910	7,604	17,607	31,121

1. FRESH FRUIT.—The yield of commercial orchards (in bushels) for 1921-22 was: Apples, 989,614; pears, 157,261; soft fruits (peaches, nectarines, apricots, plums, cherries), 297,500; citrus (chiefly lemons), 14,404.

Imports: 1913, 9,719·3 tons (£181,663); 1921, 12,840·7 tons (£279,450). Exports: 1913, 674·8 tons (£12,245); 1921, 913 tons (£23,657).

2. DRIED FRUIT:

		Raisins (Tons).	*Currants (Tons).*	*Other Kinds (Tons).*
Imports	1913 ..	1,394·1 (£43,827)	421·4 (£10,978)	1,567·1 (£42,254)
	1921 ..	1,919·4 (183,637)	144·9 (£183,637)	1,735·3 (£83,685)
Export	1913 ..	0·9 (£39)	1·5 (£54)	7·7 (£321)
	1921 ..	80·1 (£6,645)	29·8 (£2,535)	16·0 (£1,766)

3. BOTTLED AND PRESERVED FRUIT.—Imports: 1913, 184,874 dozen (£39,027); 1921, 86,277 dozen (£42,218). Exports: 1913, 1,475 dozen (£500); 1921, 4,604 dozen (£2,972).

4. PEEL.—Imports: 1913, 253·7 tons (£3,990); 1921, 61·4 tons (£2,891); Exports: 1913, 4·6 tons (£38); 1921, 1·1 tons (£153).

5. FRUIT PULP AND PARTLY PRESERVED FRUIT.—Imports: 1913, 16·5 tons (£621); 1921, 94·3 tons (£5,290). Exports, 1921 (to U.K.), 7·9 tons (£452).

6. JAMS AND JELLIES.—Imports: 1913, 282·8 tons (£15,464); 1921, 188·7 tons (£17,106). Exports: 1913, 53 tons (£2,160); 1921, 45·4 tons (£4,329).

7. LIME-JUICE AND FRUIT SYRUPS.—Imports (value): 1913, £4,142; 1921, £7,236. Exports (value): 1913, £74; 1921, £453.

VIII.—EDIBLE NUTS.

1. ALMONDS.—The yield of commercial orchards for 1921-22 included 267 bushels of walnuts. Imports (mostly foreign): 1913, 134·2 tons (£16,810); 1921, 52·1 tons (£10,237). Exports: 1913, 0·2 tons (£12); 1921, 2·1 tons (£430).

2. WALNUTS.—Imports (mostly foreign): 1913, 37·1 tons (£2,566); 1921, 88·4 tons (£7,205). Exports, 1913, 1·9 tons (£64); 1921, 0·3 tons (£36).

3. OTHER EDIBLE NUTS.—Imports (value), mostly foreign: 1913, £9,600; 1921, £18,542. Exports: 1913, £322; 1921, £61.

IX.—VEGETABLES.

There were 4,759 acres occupied by market gardens in 1910-11, and 4,262 in 1921-22. This does not include onions.

1. ONIONS:

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Tons).*	1913 and 1921. *Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	2,688·2 (£23,928)	658·5 (£4,559)
1921–22 ..	484	4,122	8·2	166·0 (£17,661)	27·0 (£2,662)

2. OTHER VEGETABLES (fresh, dried, or preserved).—Imports (value): 1913, £3,095; 1921, £3,859; Exports: 1913, £630; 1921, £948.

X.—Miscellaneous Imports and Exports for 1913 and 1921.

1. Biscuits.—Imports: 1913, 92·6 tons (£7,644); 1921, 52·6 tons (£11,241). Exports: 1913, 262·3 tons (£6,335); 1921, 77·5 tons (£4,411).

2. Confectionery.—Imports (value): 1913, £141,570; 1921, £149,740. Exports (value): 1913, £580; 1921, £8,608.

3. Infant and Invalids' Food.—Imports (value): 1913, £17,909; 1921, £15,061. Exports (value): 1913, £15,404; 1921, £605.

4. Malt Extract.—Imports (value), 1921, £585. Exports (value), 1921, £51.

5. Sago and Tapioca.—Imports: 1913, 1,250·2 tons (£18,298); 1921, 1,056·6 tons (£2,213). Exports: 1913, nil; 1921, 2·6 tons (£98).

6. Farinaceous Food, Various.—Imports (value): 1913, £2,213; 1921, £1,930. Exports (value): 1913, £26; 1921, £157.

7. Chaff.—Imports: 1913, 1,473 tons (£6,381); 1921, 5 tons (£37). Exports: 1913, 202 tons (£1,176); 1921, 166 tons (£1,532).

8. Various Stock-Foods.—Imports (value): 1913, £12,546; 1921, £7,876. Exports (value): 1913, £626; 1921, £1,183.

9. Oils and Oil Residues. *Olive Oil.*—Imports: 1913, 6,248 gallons (£2,159); 1921, 5,963 gallons (£5,963).

Cocoa Butter.—Imports: 1913, 288·8 tons (£23,992); 1921, 421·1 tons (£61,391). Exports: 1913, 1 ton (£125); 1921, 6 tons (£888).

10. Aerated and Mineral Waters.—Imports (value): 1913, £2,569; 1921, £504. Exports (value): 1913, £712; 1921, £373.

XI.—Potable Alcohol.

1. Spirits, Liqueurs, and Cordials.—Imports (less re-exports) in gallons as follows:

	Brandy.	*Whisky.*	*Gin.*	*Rum.*	*Other Spirits.*	*Liqueurs, etc.*
1913 ..	73,604 (£39,460)	732,679 (286,243)	127,204 (£35,320)	17,693 (£4,373)	12,980 (£6,143)	4,982 (£4,622)
1921 ..	47,023 (£61,535)	702,224 (£666,482)	43,815 (£37,481)	7,869 (£7,600)	7,494 (£4,311)	3,727 (£6,550)

2. Malt Liquors. (*a*) *Malt.*—Imports, 2,705 bushels (£964) in 1913, and 2,791 bushels (£1,812) in 1921.

(*b*) *Hops :*

	Acreage.	*Total Yield (Tons).*	*Yield per Acre (Cwts.).*	*Imports (Tons).*	*Exports (Tons).*
1913–14 ..	—	—	—	39·0 (£5,790)	223·0 (£22,760)
1921–22 ..	54[a]	303·4	11·2	8·6 (£3,702)	44·9 (£19,142)

(*c*) *Ale, Beer, and Porter:*

	Production. (*Thousands of Gallons*).	*Imports* (*Gallons*).	*Exports* (*Gallons*).
1913–14 ..	—	293,012 (£57,854)	16,821 (£1,988)
1921–22 ..	14,323·1	23,966 (£11,353)	10,261 (£3,038)

3. WINE.—There is a small vineyard area in North Island, the acreage being 179 in 1921-22. Most of the crop is used for wine-making, though a part is devoted to table grapes.

Imports (gallons): 1913, 145,098 (£67,034); 1921, 111,715 (£106,606). Exports (gallons), 1913, 1,882 (£2,568); 1921, 3,144 (£4,667).

ISLANDS ATTACHED TO NEW ZEALAND

These include the Cook and some other islands, of which the population in 1921 was 13,209 (360 Europeans). The chief exports (mainly to New Zealand) are fruit and copra. In 1921 the following number of cases were exported: Oranges, 57,169 (£22,343); bananas, 52,388 (£21,680); tomatoes, 34,457 (£11,169). Other items were coconuts, pineapples, lemons, mangoes, sweet potatoes (kumeras), and arrowroot. The fruit industry is susceptible of considerable development.

FIJI

Area, about 7,083 square miles. Population (1921), 157,266 (3,878 Europeans). The islands are extremely fertile, and some of the exports, particularly sugar, are of great importance.

	1913.	
	Acreage.	*Total Yield.*
Maize	3,397	104,096 bushels
Rice	13,508	29,687 tons
Yams	313	252 „
Beans	3,274	11,111 bushels
Sugar cane	48,208	736,992 tons
Bananas	6,608	668,095 bunches
Pineapples	99	500 cases
Coconuts	32,915	167,668 (number)

CHIEF IMPORTS.

		1913.	1921.
Rice	Tons	1,909	742
	£	20,865	12,496
Flour: sharps and pollard ..	Tons	5,931	4,917
	£	50,883	77,198
Biscuits	Tons	623	582
	£	17,037	26,164
Spirits	£	11,360	27,481

CHIEF EXPORTS (DOMESTIC PRODUCE).

		1913.	1921.
Sugar	Tons	94,710	72,624
	£	1,041,927	2,053,405
Bananas..	£	168,249	—

PACIFIC ISLANDS

The chief islands here included are the British Solomon Islands, Gilbert and Ellice Islands (with Fanning Island, a Pacific cable station), Tonga or Friendly Islands, Phœnix Islands, Pitcairn Island, and the New Hebrides, which have a collective area of about 17,080 square miles, and an approximate population of 268,500 (2,218 Europeans). The copra industry is of greatest importance, but there is some export of maize, arrowroot, and fruit.

GILBERT AND ELLICE ISLANDS: CHIEF IMPORTS.

	1919–20.
Provisions	£52,906
Potable alcohol	£2,131

TONGA PROTECTORATE: CHIEF IMPORTS.

	1913.	1921.
Flour	£6,128	£10,431
Biscuits	3,215	5,284
Sugar	2,988	7,785
Pickles and oilstores	3,086	4,101
Beer, ale, and porter	859	1,751
Spirits	752	4,220

SECTION III

SUMMARY AND CONCLUSIONS

ALTHOUGH this particular volume of the Series is only concerned with food of vegetable origin, and therefore deals with agriculture in the limited sense (animal food products are dealt with in the next volume), horticulture, and allied industries, the introduction of certain generalities is unavoidable. Owing to the disintegration of Europe as a result of the War, civilization, including trade and commerce, has been thrown into the melting-pot, and before a new order of things has evolved and become stabilized far-reaching reorganization will be necessary, and the British Empire is fully alive to this, as shown by the deliberations of the Imperial Economic Congress. We are trying to adjust ourselves to a fresh set of conditions, and what we do now will profoundly influence, not only the future of the Empire, but the future of the world.

The realization of the ideal of a self-feeding Empire, so far as essential commodities are concerned, is not an impossibility, while a certain amount of progress in that direction is generally regarded as essential; but to produce an exportable surplus of goods is useless without the necessary markets for disposal. While the consolidation and expansion of inter-Empire trade may do much in this direction, we shall always depend to a greater or less extent on other countries as customers, and imports from such countries will always bulk largely in our trade returns. If the countries that fought together in the War would heartily co-operate in peace, the progress towards stabilization of trade might be accelerated. There are also some non-British countries in which we have a large financial stake, such as Egypt and the Argentine, and these would naturally be taken into account in reorganization activities.

Agriculture is, and always must be, a fundamental industry, and requires to be put on a sound basis if advances in other directions are also to be sound. It is not only the question of food production, but of the maintenance of a healthy rural population, upon which urban centres depend for renewal of their vitality.

DEVELOPMENT OF EMPIRE FOOD RESOURCES

The present time is very opportune for endeavouring to develop any or all the resources of the Empire, as the relations between the home country and the overseas Dominions have never been so close, largely owing to the intimate association brought about by fighting together for nearly five years. Sentiment is more important as a business asset than commonly supposed, but its value

must not be overestimated. Although the average Briton would doubtless prefer, other things being equal, food produced by the Empire to that imported from foreign countries, his purchases mainly depend on prices, and the average purchaser is little, if at all, concerned with country of origin. The educational importance of the British Empire Exhibition in this, as in all other respects, can hardly be overestimated.

Nor must we forget that sentiment cannot be expected to appeal to the enormous native populations of the Indian Empire and the Crown Colonies, who quite naturally eat what suits them, without thinking or even knowing about its origin, and determining their choice, if there be any, by price alone.

The maintenance and intensification of the cordial spirit now existing between Britons living in all parts of the Empire depend primarily on sound *migration policy*. The value of sentiment is here illustrated by the success which seems likely to attend the " county " scheme for Australia. For a group of persons, say from Devon, to settle down together overseas removes a common objection to leaving the home country. It is, indeed, grafting a bit of " home " into the vital organization of a Dominion. Even the recent adoption of the word " migration," to signify movement from one part of the Empire to another, as against " emigration," which we now use to signify leaving home for a foreign country, stresses the practical value of sentiment.

As already pointed out (pp. 19-20 and 34), the development of the United Kingdom food resources is necessary as a means of *National Defence*. This was clearly realized during the War, when the intensive submarine campaign of the enemy made short commons the order of the day for a considerable time, and stimulated agricultural production in these islands to an extent hardly credible. Over half a million tons of wheat, etc., went to the bottom of the sea in the course of two years as the result of enemy action. Germany, on the other hand, was in possession of a well-developed and organized farming industry, and this enabled her to carry on for nearly five years, in spite of a vigorous blockade. We resolved at the time never to be caught again, and to maintain a largely increased acreage of arable land. But the War once won, economic forces prevailed, and our new plough lands speedily tumbled down to grass. This may have been inevitable, but it is always wise to prepare for the worst, and in this particular matter it should never be forgotten that the marvellous development of aircraft has robbed us of our insularity and made us, for military purposes, part of the Continent of Europe.

The development of our Empire food resources beyond the minimum necessary for safety is, of course, a question of economics. The rise of industrialism in this country has been accompanied by a rapid increase in population. When the first general Census of Great Britain and Ireland was taken in 1801 this stood at 16,345,646, and the following figures, for twenty-year periods, will speak for themselves: 1821, 21,272,187; 1841, 27,036,450; 1861, 29,321,288; 1881, 35,241,482; 1901, 41,976,827; 1921, 47,157,747 (as no census was taken in Ireland that year the Irish figures for 1911 have been added in). Some slight reduction in density has taken place since the War, since our migrants and emigrants taken together have exceeded the immigrants to this country in number.

Figures as follows:

	Migrants.	*Emigrants.*	*Migrants plus Emigrants.*	*Immigrants.*
1919 ..	136,657	43,575	201,504	193,601
1920 ..	246,630	105,799	437,879	283,705
1921 ..	188,552	79,707	377,507	227,583

(Europe is not considered in above figures.)

As the United Kingdom became more and more industrialized, and the population increased, the demand for cheap food became greater and greater. At the same time, the insidious process of rural depopulation—migration from the country to the town—steadily depleted the man-power necessary for increasing agricultural production. For a long time our farmers were able to satisfy a large part of the food demand, but the importation of foreign food, especially American wheat, became necessary to meet the rest of that demand. This importation began in 1765, and the amount imported has steadily increased, other commodities being continually added to the list, until now the bulk of our food comes from overseas.

We were able to feed ourselves, for the most part, well on into the nineteenth century, since production was largely increased by improvements in farming adopted as a result of the Napoleonic Wars. During the first ten years of last century our average annual import of wheat only amounted to 600,000 quarters, and during the following decade the average was even reduced to 458,578 quarters. A period of fictitious agricultural prosperity followed the peace of 1815, but the repeal of the Corn Laws in 1846 marked the definite adoption of a cheap food policy, which has resulted in steady diminution of home-grown supplies. Nevertheless, farmers continued to hold their own for a considerable time, in spite of a severe depression in 1849-52, followed, however, by a period of great prosperity, due to rise of prices brought about by the Crimean War, the discovery of gold-fields in California and Australia, and striking improvements in agricultural practice. Decline then set in, but our farmers did pretty well in the early seventies, partly owing to inflation of prices by the Franco-Prussian War, though the competition of American wheat began to be serious in 1872. The year 1875, however, marks the beginning of a period of depression (particularly serious in 1884 and 1893), accentuated by a series of bad seasons, of which the most disastrous was in 1879. The following table shows the stages in reduction of arable, wheat land, and production, and increase in imports of wheat and flour from 1870 to 1914:

	Arable Acreage.	*Wheat Acreage.*	*Home-Grown Wheat (Quarters).*	*Imported Wheat and Flour (Quarters).*	*Percentage Home-Grown.*
1870 ..	24,092,075	3,761,457	13,419,496	8,661,427	64·1
1880 ..	22,869,608	3,058,074	5,905,020	15,973,956	27·0
1890 ..	20,929,868	2,478,677	9,499,235	19,222,371	33·1
1900 ..	19,528,408	1,898,863	6,790,262	23,006,072	22·8
1910 ..	19,603,821	1,856,485	7,074,179	27,779,886	20·3
1914 ..	19,414,166*	1,904,932	7,804,041	27,509,831	22·1

The position as regards wheat may be summarized by stating that the decline in British agriculture has resulted in only one-fifth of our requirements being home grown. From the Empire point of view the position might be much worse. Originally we were obliged to rely entirely, or mainly, upon foreign sources of supply, especially the United States and Russia; but now a considerable part of our imported wheat comes from the Dominions, especially Canada, the Empire produces enough wheat for its own requirements, and its powers of production are capable of large extension. If it were possible to adjust distribution the Empire would be able to dispense with foreign wheat altogether, and also to export to other countries. It is, of course, a matter of cost of production and cost of transport.

From what has been said it will be realized that the United Kingdom has become so industrialized that food production has declined to an extent only justifiable under conditions of continuous world peace—conditions that have yet to be realized. So long as our Navy and Air Force are sufficiently powerful to guard with efficiency the ships that bring our imported food to us, we are not likely to be starved out in the event of prolonged war. But in any case we cannot expect our Dominions and Colonies, and the Empire of India, to be content with producing food and raw materials. They, in their turn, are likely to be increasingly industrialized. The manufactures of Canada are already very important, and Australia, despite her scanty population, is vigorously endeavouring to develop industries of every kind. Even in New Zealand, so eminently adapted to agriculture and pastoral production, the " urban drift " is making itself felt.

If we consider the history of any civilized country it will always be found that food production becomes more or less subordinated to industrialism as time goes on, and this is associated with an increase in material prosperity, always provided the process does not go too far. It has certainly gone too far when the food supply is mainly of foreign origin. Should such a stage ever arrive in the evolution of the British Empire, as a result of the demand for cheap food for those engaged in manufacturing industries, the foreign countries supplying the food would be able to raise their prices and the food would cease to be cheap. Besides, as previously emphasized, urban vitality largely depends on the existence of a healthy and vigorous rural population. Sir Daniel Hall deals with this aspect of the agricultural question in a striking passage of his book *Agriculture after the War* (pp. 15, 16):

" A population dependent entirely upon manufactures gives rise to an unstable State, subject to comparatively violent fluctuations of employment from causes which are liable to affect all industries simultaneously. An agricultural community alongside the industrial one serves as a reservoir for labour, absorbing the fluctuations because its own variations depend upon different factors, and so equalizing the demand. Politically a country population is the more sober and cautious, because it is in touch with certain fundamental aspects of existence that are hidden away from the purely town dwellers. No one concerned with the ultimate welfare of our nation can view with equanimity the tendencies of the last half-century, the continuous depopulation of the country and the growth of the towns.

If the process continued our State would become economically parasitic upon the more primitive food-producing countries; and a parasite, however highly organized, cannot continue to exist if the connection with its host is severed."

METHODS OF INCREASING EMPIRE FOOD PRODUCTION

The problem here awaiting solution differs in character in the various parts of the Empire. At least three cases require consideration: (1) The strongly industrialized—if not over-industrialized—United Kingdom, which is more dependent on imported food than any other country. (2) Dominions such as Canada, Australia, and New Zealand, with a mainly British population, and, at present, having a surplus of food for export. (3) The Empire of India, the Union of South Africa, and the Crown Colonies, where the native population largely predominates, which export many kinds of food, but also import others. The last feature applies more particularly to our tropical Colonies, which are not adapted to close settlement by Europeans.

I.—The United Kingdom.

The decline of agriculture, as already indicated, has been simply a matter of economics, a question of prices, and the revival in the industry that took place during the four years before the outbreak of war demonstrates that under normal conditions our farmers are able to make good in spite of strong foreign competition. They are still able to do so as regards live-stock and animal products, but have frankly admitted their inability to maintain, far less increase, their present output of wheat and other cereals for human consumption without some kind of assistance from the State. This unfortunate state of things has been brought about, very largely, by the necessary increase in the post-war labour bill and the repeal of the short-lived Corn Production Act, necessitated by financial considerations.

It is important to remember here that reduction in the area of arable land affects not only the agricultural community, but the country as a whole. Far less labour is required for grazing land than for arable, and the conversion of 3½ million acres of arable into grass land during the forty years following 1872 threw 261,000 men out of employment in agriculture—seven men for every hundred acres. There can be no doubt at all that reduction in the amount of arable at the present time would swell the lamentably long list of those unemployed and add to the burden of the taxpayer.

An Agricultural Tribunal of Investigation was appointed by Mr. Bonar Law at the end of 1922, its reference being "... to enquire into the methods which have been adopted in other countries during the last fifty years to increase the prosperity of agriculture and to secure the fullest possible use of the land for the production of food and the employment of labour at a living wage, and to advise as to the methods by which those results can be achieved in this country."

In its second interim report, issued in November, 1923, the Tribunal express it as their opinion that direct action by the State is necessary if further

substantial decline in the tillage area is to be prevented, and after considering the various possible ways in which financial assistance might be given, recommend a subsidy.

"We recommend a subsidy of 10s. per acre on all arable land (that is, all land ploughed during the year, including summer fallow, but excluding land under clover and grass seeds, small fruit, orchards and hops), and an additional subsidy of 10s. per acre on all land under wheat. The cost of this proposal on the present tilled area of about 10,350,000 acres would be some £5,175,000, and the cost of the additional subsidy on wheat £900,000, making a total of £6,075,000. This scheme may cause some increase in the tilled area, but we do not anticipate that it is likely to rise much above 11,000,000 acres, or the wheat area much above 2,000,000 acres. On this basis the subsidy would cost £6,500,000, and we regard this sum as practically the outside limit."

"It may be asked why wheat should be singled out for special benefit. We would reply that it is the main factor in the maintenance of arable farming in England, that it is the most essential food-stuff, and that it is the crop which has suffered most by the fall in prices. The present price of wheat is only 19 per cent. above the pre-war level, whereas the index number for agricultural produce generally is 53 per cent. above pre-war, and it does not seem likely that the price of wheat will materially improve. It is significant, too, that two-thirds of the decline in the total arable area in England during the last fifty years is accounted for by the shrinkage in the acreage under wheat and barley."

"In making our recommendation we are of opinion that, in order to place a premium on good farming, the Minister of Agriculture should have power to reduce or withhold altogether the subsidy in cases where he is satisfied that the farmer has not cultivated his holding according to the rules of good husbandry as defined in the Agriculture Act, 1920, and we consider that the county agricultural committees should be charged with the duty of furnishing the Minister with the necessary information."

State subsidy, however, is not the only method for improving the position of agriculture in this country. It is often forgotten that farming is a very complex and difficult matter, involving not only the innumerable details connected with production, but also a business side. The best type of British farmer is an expert producer, though in many cases there is ample scope for improvement in practice. But it cannot be said that the average farmer is a good man of business, nor, indeed, has he much time to spare for the purely financial side of agriculture. There are, it is true, outstanding men who are not only expert producers, but thoroughly skilled in the art of disposing of their produce to the best advantage; though from the nature of the case such men are always likely to be in a very small minority. Hence it follows that farmers, in the main, fail to secure their fair share of the profits of their industry, an undue proportion of which is absorbed by middlemen and retailers.

The great expense of inland transport, especially in the case of wheat, imposes a heavy load on arable farming. As Mr. Hugh R. Rathbone justly remarks (*The Staple Trades of the Empire*, p. 150):

" Railway carriage of wheat in this country for long distances is almost prohibitive, and for this reason . . . the milling industry has more and more gravitated to the seaboard. Under normal ocean freight conditions it is generally cheaper to move grain from Chicago to Liverpool than to carry it from Lincolnshire to Birmingham. Those who have studied the railway question in the matter of remuneration of long hauls will know that rates are often lower for the long haul, including a long ocean voyage, than they are for a small part of the haul in this country. Thus it may be cheaper to bring grain from New York to Birmingham via Bristol than it is to take grain from the Bristol neighbourhood to Birmingham. On the face of it this differentiation in favour of the longer haul often seems unfair and illogical, but there is much to be said on the other side. It is a highly complicated question, and can only be alluded to here as one of the difficulties our internal traffic has to face."

The question of railway carriage will receive attention in the volume on Transport in this Series, and it must suffice to mention it here as one of the difficulties with which the farmers of the United Kingdom have to contend.

Primarily in the interests of the consumer, a Departmental Committee, with Lord Linlithgow as chairman, was appointed at the end of 1922 " to enquire into the methods and costs of selling and distributing agricultural, horticultural, and dairy produce in Great Britain, and to consider whether, and if so by what means, the disparity between the price received by the producer and that paid by the consumer can be diminished." The findings of this Committee have been embodied in a final report, and four interim reports were made, one of these being on " Cereals, Flour, and Bread," in which the following conclusions are reached:

" We have investigated the system of distributing cereal crops and find it to be, on the whole, both simple and inexpensive. So far as the manufacture and sale of bread is concerned, we have shown that the time has come for many bakers to reduce their prices consequent on recent reduction in costs, notably in the price of flour."

" We have emphasized that, as the farmer cannot look for any immediate and material improvement in the prices he obtains for his wheat by alterations and economies in the established methods of production and distribution of either flour or bread, steady and permanent improvement in prices is to be sought by enhancing the intrinsic commercial value of the wheat he grows. This he can do by concentrating on the production of newly evolved varieties of wheat of high milling quality. Indeed, up to the limits of available supply, there is even now no reason why consumers should not be supplied with a high-class all-English loaf if farmers will grow suitable wheat, if millers will manufacture the flour, if bakers will use it, and if all three combine to make the merits of this all-British product known to the public. The creation of an articulate demand is essential. The natural play of economic forces will determine the course events will take, but if for wheat of high milling quality the farmer ultimately obtains the higher price to which he is or will be fully entitled, while, at the same time, improved varieties yield satisfactorily, wheat production in this country would receive much-needed encouragement."

It seems probable that the solution of the general problem of how to improve the business side of agriculture will be solved by some method of co-operation. This has undoubtedly worked wonders in Denmark and Sweden, as is sufficiently attested by the facts, and by the testimony of those who, like the present writer, have had the opportunity of studying the matter in the countries concerned. There we find intensive and highly skilled production associated with an excellent business system. One secret of the success of Danes and Swedes in agriculture is undoubtedly to be found in their superior system of education, which puts our own entirely in the shade.

Agricultural co-operation in this country has not met with the success it merits, partly owing to our inherent conservatism as to methods, our lack of enthusiasm for education, and the apathy of the State. But the wonderful work done by Sir Horace Plunkett in Ireland shows what can be effected by co-operation even in the face of great difficulties. The complete reform of the egg industry in the sister island is one of the most striking instances of its efficiency. Originally, eggs—of variable and often unknown age—were collected by "higglers," who secured the lion's share of the profits. At that time the "Irish egg" was a very doubtful quantity, though often of undoubted value in times of political crisis. Ultimately the system was so reformed that Irish eggs were collected, graded, properly packed, and put on the English market within three days of being laid, and the producer received his fair share of the profits.

It can, at any rate, be confidently asserted that purely agricultural small holdings, with the rarest exceptions, can only be made an economic success by the adoption of co-operative measures.

One of the prime causes of rural depopulation before the War was the low rate of remuneration of the agricultural labourer, by no means an "unskilled" worker, as often supposed by the town-dweller. It seems improbable that his wages will be allowed to revert to the old scale. Consequently the difficulty of an increased labour bill is likely to be permanent. But there are many cases where adoption of improved, up-to-date methods, and the exercise of greater care in business transactions, might do a good deal more than meet this extra post-war expense.

The question of labour-saving machinery is naturally of great importance in this connection, especially in cases where acute shortage of labour is experienced. Notable advances in this respect have been made in the past, and the introduction of the self-binder affords a striking example of certain possibilities. There is no reason to think that further progress in this direction will cease in the future, but unfortunately elaborate mechanical devices do not justify their cost on small farms, of which there are so many in this country, and are almost entirely ruled out in the case of small holdings.

Some of the results of agricultural research, in their practical application to farming, are beginning to exert an important influence in various ways, particularly by saving unnecessary expenditure, increasing yield, and reducing wastage of crops. Expert advice on what may be termed the scientific side of agriculture is easily obtainable, at small and often no expense, in practically every county, but it may be doubted whether the average farmer takes full

advantage of this. Manuring, for instance, is a highly scientific matter, and there can be no doubt at all that large sums of money are often spent on manures of unsuitable kind for the end in view; while, on the other hand, the yield of a particular crop may be very inadequate for lack of expenditure on the fertilizer it requires. And even though a farmer may purchase the most suitable kind of artificial manure he may not secure full value for his money. The selection of suitable varieties is also a matter of great importance, and much may be expected from the results of scientific plant-breeding, some of which have been very striking, such, for instance, as the production of rust-resisting varieties of wheat. Weeds, rats, and pests of fungoid or insect nature levy an enormous toll upon our crops, fruit, and vegetables, and this loss can only be minimized by the employment of measures which are the outcome of scientific research.

FRUIT-GROWING is a national industry of great and increasing importance, not only as regards the production of fresh fruit, but also in relation to jam and preserved fruit, syrups, cider, and perry. It has only been put on a fairly sound footing of recent years, mainly as a result of competition with imported fruit, which originally commanded higher prices on the market, chiefly owing to better grading and packing. The industry, as now reformed, owes much to scientific research, more particularly as regards the control of fungoid and insect pests, which are even more troublesome than in ordinary agriculture. In many cases grading and packing receive adequate attention, and ultimately we may hope to see the best methods employed everywhere.

In certain parts of the country, particularly the West of England, cider has always been the favourite form of potable alcohol, and its quality has been greatly improved of late years, largely as the result of the research work done at the Agricultural and Horticultural Research Station (formerly the Fruit and Cider Institute) at Long Ashton, near Bristol. There is no reason why, in the course of time, cider should not become a serious rival of the lighter kinds of imported white wine. The consumption of perry, or pear cider, is small and mostly local, probably because most persons are unaware of its existence. But, next to cider, it has a good claim on those who appreciate the merits of white wine as a beverage.

VEGETABLE GROWING may be regarded as a highly intensive form of agriculture, and, like fruit-growing, is highly indebted to scientific research in the matter of fungoid and insect pests. Our supply of vegetables is, from the nature of the case, largely home-grown, but the imports are not inconsiderable, and there seems no reason why we should not reduce these by increasing home production. The super-intensive method of French gardening, which once seemed likely to find favour in this country, is now little practised, but it possesses considerable possibilities and deserves a more extended trial.

While purely agricultural small holdings, run without co-operation, have not proved a success, the opposite is true for some holdings of the kind which have been devoted to raising fruit and vegetables. Given a suitable soil and marketing facilities there might very well be some possibility of extending this kind of enterprise. Although fruit-growing is always admittedly risky in the

absence of appreciable capital, vegetable-growing is a much safer speculation, for this is not a case of putting all your eggs into one basket.

In the growing of fruit and vegetables, as in ordinary agriculture, the questions of relative share of profits and of marketing are of primary importance. The second interim report of Lord Linlithgow's Committee deals with these commodities. It is full of interesting information, makes a number of important suggestions, and reaches certain general conclusions. We are told that: "The fruit and vegetable industry is unique in the number and variety of intermediaries who may, at times, be engaged in handling the produce, and whose sole service is that of distribution. In the case of other commodities, distributive services more usually include, not only the operations of collection and distribution, but also the preparation and treatment of the produce to render it more adaptable to the consumer's needs."

The industry is greatly handicapped by heavy railway charges by which, for example, early Cornish broccoli is unable to compete in our northern markets with imported produce. There is also much need for more co-ordination between the various interests concerned. There is room for much improvement in grading and packing, and the use of standardized containers is strongly recommended. Considering the perishable nature of the commodities handled and the surplus available for canning, it is somewhat remarkable that the home market for tinned fruit is left to importers, while the preservation of vegetables by canning is almost wholly undeveloped in this country. Attention is called to the research factory at Campden (in co-operation with the Long Ashton Institution), which is conducting experiments on the preservation of fruit and vegetables, by canning and in other ways.

It is also interesting to learn that the high price of jam, mainly due to dear sugar, has resulted in a decrease in consumption in favour of margarine, which can be produced more cheaply.

The report, in its final conclusions, states that:

"... The picture presented to us by the evidence we have received is that of an industry deeply disturbed by war and post-war conditions. The less progressive growers and distributors appear to be waiting for the return of pre-war conditions. The more progressive growers and distributors, on the other hand, are fully alive to the needs of the moment. Perceiving the widespread change in prices and conditions of trade which are the aftermath of war, they are earnest in their endeavour to improve the methods and to lessen the cost of the various processes, whether of production or distribution, in which they are engaged. The best hope for the future lies with the industry itself. Producers must realize that marketing is the other half of production. They must make it their business to increase their knowledge of market conditions and requirements in order to dispose of their produce in the home markets to the best advantage in competition with produce grown in other lands. Distributors, for their part, must make every effort to eliminate archaic methods and to enhance the efficacy of the general distributive system. Retail distributors, in particular, should make serious efforts in the direction of increasing turnover when supplies

are abundant, by charging lower prices to the consuming public. It should be the aim of all concerned in the industry to facilitate the passage of fruit and vegetables from the land to the home. The policy of preferring high prices and smaller turnovers to increased business on a lower price basis checks the even flow of supplies, and is inimical to the interests of the retailer himself, as indeed to the interests of all."

II.—Dominions with Mainly British Population and Producing a Surplus of Exportable Food.

The facts already set forth with regard to Canada and Australia demonstrate their great importance as food producers and exporters, and the further development of their almost unlimited resources is primarily a question of man power. It is only the large use of labour-saving machinery, for which the conditions are suitable, that enables them to produce so much. Encouragement of migration, always provided the migrants are of suitable character, is urgently necessary in their interests and in our own, and it may be said that the solution of many Empire problems is largely dependent on judicious redistribution of Empire population. It need hardly be said that capital is welcome as well as labour, and there is plenty of room not only for agricultural and horticultural labourers, but also for those who intend to be employers of labour in the sphere of food production.

New Zealand is in a different position with regard to migration, and her resources are more fully developed, as might be expected with the comparatively dense population of 12·57 per square mile. There is still room, however, for a considerable number of trained male agricultural workers, provided they are unmarried, though some places are available for married men without families.

It is much to be hoped that Canada will take advantage of the disorganization of the European beet sugar industry to increase production in that direction, while the possibilities of extending the cane sugar and tropical fruit industries in Queensland are very considerable.

More intensive cultivation, resulting in a larger yield per acre, will doubtless, as time goes on, be practised in Canada and Australia, and even in New Zealand some advance in this direction is possible. All three Dominions make full provision for agricultural education and expert advice. In Canada, where winter means cessation of activities on the land, admirable practical and theoretical instruction is given during that season, so that the Canadian farmer has the opportunity of keeping up to date.

As will be seen from the data furnished in Section II., the three Dominions in question are making steady advances in the working up of various harvested products, not only meeting their own requirements, but producing an exportable surplus of commodities lending themselves to more economical transport than the raw food. Among these are flour and other cereal products, refined sugar, canned fruits, and, in the case of Australia, dried fruits and also wine, especially that of improved quality.

Preferential tariffs, already in force to some extent, naturally stimulate inter-Empire trade in food of vegetable nature or origin, and help materially towards the ideal of a self-feeding Empire. The United Kingdom depends for its prosperity upon exports, and benefits directly as the other parts of the Empire become more wealthy, and absorb an increasing amount of such exports.

Much depends, in the promotion of inter-Empire trade, upon transport and other complex matters upon which the exchange of commodities depends, and here an exhaustive investigation is necessary. This will doubtless be an important part of the work discharged by the Committee which has been established as one result of the recent Imperial Conference. CANADA is relatively near the United Kingdom, but the length of the sea-route by which this is separated from AUSTRALIA and NEW ZEALAND considerably increases the cost of transit. From the direction which trade is taking, however, there can be no doubt that the two latter Dominions will play an increasingly important part in exporting food to the African and Asiatic parts of the Empire, and they are in addition the natural emporia for the smaller British possessions in the Pacific. The corresponding import trade, already considerable, will doubtless attain much larger dimensions. There is some volume of trade in food of vegetable nature or origin between Australia and New Zealand. Australia, for example, buys a considerable quantity of hops from New Zealand, whom, on the other hand, she supplies with wheat, raisins and wine.

Other details regarding Canada, Australia, and New Zealand may be gathered from the following figures and statements, taken from the official year books.

CANADA.

TRANSPORT.—The last official report of the Dominion Bureau of Statistics showed 39,771 miles of railway in operation on January 1, 1922, as compared with 39,384 miles on January 1, 1921, 30,795 miles in 1914, and 17,657 miles in 1900. On October 5, 1922, the Grand Trunk Railway came under Government control as part of the Canadian National Railway system. During the navigation season the waterways of Canada are of great importance, but the winter stagnation of business has only been prevented by the construction of railways. "The steam railway was required for the adequate economic development of Canada, more particularly for linking up with the economic and industrial world the vast productive areas of the Canadian west, and thus promoting their development. The construction of the Canadian Pacific Railway gave to Canada as an economic unit length, but it was 'length without breadth.' The building of the newer transcontinental railways has for the first time given the country breadth—a fact which in another ten years, as settlement fills the extensive areas thus opened up, will be more evident than it is to-day" (1921 *Year Book*, p. 521).

FACTORIES.—The industrialization of Canada has involved the setting up of factories concerned with working up products of vegetable origin, as will be seen by inspection of the following figures for 1919:

	Number.	Cost of Materials. (Thousand $).	Value of Products. (Thousand $).
Biscuits and confectionery	325	28,306·7	52,238·1
Bread and other bakery products	1,690	33,682·5	52,318·4
Evaporated fruits and vegetables	77	951·8	1,676·3
Flour and gristmill products	1,255	229,835·7	262,786·7
Fruit and vegetable canning	129	14,027·8	16,017·6
Jams and jellies	40	6,540·7	9,042·8
Macaroni and vermicelli	9	657·9	1,152·6
Maple sugar and syrup	3	654·6	988·8
Prepared flour	3	191·2	260·1
Rice cleaning and polishing	7	4,011·0	4,603·8
Sugar, refined	8	86,308·2	102,630·0
Vinegar and pickles	34	2,122·3	4,267·5
Aerated and mineral waters	320	3,385·5	7,366·7
Liquors, distilled	5	724·2	1,288·4
,, malt	57	8,093·4	20,169·0
,, vinous	16	685·5	1,527·7
Malt	7	2,374·9	3,468·8

ADMINISTRATION AND EDUCATION.—The remarkable progress which has been made in all branches of agriculture and horticulture is very largely due to effective administration by the Dominion and Provincial Governments. For the Dominion there is a Department of Agriculture presided over by a Minister, under whose direction are numerous specialists, including those concerned with experimental farms, seeds, cereals, grasses, horticulture, entomology, and chemistry. Most of the Provinces have their own Ministers of Agriculture with official staffs, and maximum efficiency is in all cases secured by complete correlation. There is an admirable system of agricultural education, adapted for students of all grades.

AUSTRALIA.

TRANSPORT.—On Government and private railways the mileage increased from 18,012 in 1910-11 to 26,202 in 1920-21. Many new lines are under construction, so that as agricultural production is increased the means of distribution will be proportionally augmented. Similar activity has been and is being shown in road extension and improvement.

FACTORIES for dealing with agricultural and horticultural produce are increasing in number, and some idea of their output may be gathered from the following table for 1920-21:

	Number.	Cost of Materials (Thousand £).	Value of Products (Thousand £).
Biscuits, etc.	53	2,180·4	3,270·2
Jams, pickles, and sauces	154	3,465·5	5,262·6
Confectionery	200	3,421·4	5,419·9
Flour mills	184	15,987·0	18,092·3
Sugar mills	37	3,733·7	5,511·9
Breweries	67	3,341·7	7,572·8
Distilleries	37	436·4	669·3

ADMINISTRATION AND EDUCATION.—The administrative machinery for the Commonwealth and its constituent States is comparable in general arrangement to that described for Canada, and of equal efficiency, and there is the same admirable provision for agricultural education.

NEW ZEALAND.

TRANSPORT.—The length in miles of the Government Railways was 2,851 in 1913, and 3,021 in 1922, there being also about 135 miles of private railways in the latter year. The mileage of roads was ascertained for the first time in 1920-21, when it was estimated at about 64,328, of which 44,462 miles were "formed" roads, the rest being "unformed" roads and bridle-tracks.

FACTORIES.—Some of the details concerning factories engaged in working up foods of vegetable origin are as follows for 1920-21:

	Number.	*Cost of Materials (Thousand £).*	*Value of Products (Thousand £).*
Grain-milling	53	2,819·3	3,426·9
Biscuits and confectionery	51	792·2	1,270·9
Fruit-preserving and jam-making ..	10	208·3	316·6
Brewing and malting	56	648·5	1,463·5
Sauce, pickle, and vinegar making ..	15	119·6	184·5

ADMINISTRATION AND EDUCATION.—There is a Minister of Agriculture presiding over a Board divided into various branches, of which the most important are concerned with the pastoral industry, the remarkable advances made in which are dealt with in the second volume on Food Production. There are experimental farms and areas for agriculture and horticulture, which are annually visited by thousands of farmers, many of whom carry out experiments on their own farms. A Board of Agriculture advises the Minister on matters relating to the development of agriculture and other rural industries in the Dominion.

An Agricultural College at Lincoln provides instruction for students of all grades.

III.—PARTS OF THE EMPIRE WITH MAINLY NATIVE (NON-EUROPEAN) POPULATION, AND PRODUCING OR ABLE TO PRODUCE AN EXPORTABLE SURPLUS OF FOOD OF VEGETABLE ORIGIN.

The overwhelming preponderance of native non-European populations throughout a large part of the British Empire raises a number of general problems. These, or rather some of them, can only be briefly considered here in so far as they affect food production. The question of climate is also of outstanding importance, for some of the tropical or semi-tropical parts of the Empire, such as Sierra Leone or the Gold Coast, are clearly not adapted for settlement by the white races on any scale. On the other hand, the Union of South Africa, Rhodesia, and over 12,000 square miles of the Kenya Colony lend themselves to such settlement, and there is still some room for white migrants in the British West Indies.

1. The EMPIRE OF INDIA is still in the food-producing stage, though in some centres industrialization is beginning, and the operations of agriculture and the allied industries are carried out by native labour. Indians themselves are taking an increasingly large share in the administration and development of their country, including the many activities connected with trade and commerce. The European population is relatively very small, and there is here no field for migration from this country—indeed considerable areas, such as Burma and South India, are not in any case adapted for absorbing part of the excess population of the United Kingdom. India, in fact, has her own migration problems, which are sufficiently well known, and supplies agricultural labour to some other parts of the Empire—*e.g.*, Mauritius, Fiji, and British Guiana.

As already indicated, the possibilities of increased food production are very large. Irrigation schemes on a vast scale are already in operation, and in conjunction with well-developed means of transport have not only mitigated the famines due to crop failures, but also done much to increase the exportable surplus of food and raw materials of vegetable origin. The next advance in this direction will be the construction of the Lloyd Barrage across the Indus near Sukkur. When this and the connected works are completed, some eight million acres of partly desert land will gradually be brought under cultivation—*i.e.*, an area exceeding by 2½ million acres the whole of that available for agricultural and allied purposes in Egypt.

Considering that Indian agriculture is well organized, that agricultural education is provided for, and that important research is being conducted with activity and efficiency, there can be no doubt that the gradual adoption of improved methods will ultimately largely increase the yield per acre in the case of many crops, among which sugar cane may be particularly mentioned. The poverty, conservatism, and lack of education of the agricultural population are the chief obstacles in the way of such advances, so that progress by way of more intensive production must be of necessity extremely slow. But a great deal will doubtless be effected, in spite of these difficulties, by the adoption of improved varieties, the constant combating of insect and fungoid pests, and similar measures.

It is, however, necessary to emphasize the fact that the vast population of India consumes the bulk of the food crops that are produced, and only a small percentage of a given yield is available for export. The actual average figures, pre-war and 1921-22, are as follows: rice, 9 and 4; wheat, 14 and 1; sugar, 0·4 and 0·2. The percentages are much higher for cotton and oil-seeds, which are given here, because edible oils and oilcakes come within the scope of this volume: cotton, 56 and 67; linseed, 73 and 40; rape and mustard, 23 and 11; sesamum, 25 and 6; ground nuts, 35 and 25.

The production and distribution of fruit are receiving attention, largely owing to the activities of the Fruit Experiment Station at Quetta, and canning is carried out at several centres. Baluchistan may be mentioned as an example of resources capable of large development.

"The upland valleys of Baluchistan might become the California of India. The Agency is one of the most favourable localities in India for the growing of fruit. The climatic conditions are almost ideal. There is a cold winter which

gives the necessary resting period for those deciduous fruit trees which are characteristic of the temperate regions, while the hot, dry summer months afford excellent conditions for ripening. Rain rarely falls in summer, and so the fruit is sound and well suited for transport. Moreover, the dry atmosphere prevents the development of fungoid pests which afflict the fruit grower in damper regions " (*Bulletin No.* 9, Fruit Experiment Station, Quetta, 1918, p. 1).

2. The UNION OF SOUTH AFRICA, for its further development, needs migrants possessing a cretain amount of capital—£2,000 at the very least—who are desirous of taking up the occupation of land after acquiring—in the Dominion—the necessary practical knowledge, including the methods of organizing and controlling native labour. Our race has always shown itself eminently adapted to such enterprises, for which a large field is also open in RHODESIA and the healthier parts of the KENYA COLONY and the TANGANYIKA TERRITORY. One source for the supply of migrants of this kind is provided by the public schools of the home country, and the voluntary work of the Public Schools Employment Bureau (Hon. Sec., W. A. Bulkeley-Evans, 5, Paper Buildings, Temple, E.C.), has included for some years the promotion of migration to all parts of the Empire.

It is eminently desirable that educational institutions of all grades and kinds in the United Kingdom should impart to those under instruction an accurate knowledge of the nature and needs of the Empire, of what life in the various Dominions and Colonies actually means, and of the chief possibilities open to intending migrants. It is true that some attention has already been paid to this vitally important matter, but much remains to be done, and the publicity departments of High Commissioners and Agents-General are not only willing, but anxious to co-operate. The British Empire Exhibition affords a unique opportunity of furthering and stimulating educational propaganda in the direction indicated. The cinematograph is undoubtedly one of the most powerful educational instruments for bringing home to an audience the nature of Empire life in all parts of the globe, and an increasing number of instructive films are available.

As already stated, the possibilities of increased food production in the Union are immense, and much can also be done in the Kenya Colony and the Tanganyika Territory. The area of cultivated land in the Union has been largely extended by the methods of dry farming and by irrigation, and the Department controlling the latter has been responsible for large expenditure. The area of irrigated land amounted to 817,862 acres in 1921, and it was then estimated that over 572,000 additional acres were irrigable.

The Department of Agriculture is divided into eighteen subdepartments, and the following list of some of the matters dealt with (quoted from the *Official Year Book*, No. 5, for 1922) will give an idea of the various activities for improving and increasing the production of food of vegetable origin: " Inspection of . . . grain and other agricultural produce for export. Control of the sale of fertilizers . . . seeds and pest remedies. Improvement of pastures. Growing of cereals and fodder plants. Control of plant diseases and insect pests. Agricultural chemistry. Viticulture. Horticulture. Collection and distribution of guano. Dry farming. Agricultural co-operation. Circulation of publications on agriculture. Crop estimates. Agricultural education. Agricultural extension work.

Agricultural experiments. Irrigation. Conservation of water. Water-boring. Meteorology."

It is particularly interesting to learn that, after many struggles, agricultural co-operation has been well established, and its future would appear to be assured: "There has recently been a great development of the co-operative movement in every province of the Union, and farmers of all kinds are keenly interesting themselves in the organization of co-operative marketing associations. To meet the demands of the times, a new Co-operation Act to regulate the constitution of Co-operative Agricultural Societies and Companies throughout the Union was passed during the 1922 session. This *Co-operative Societies Act* (Act No. 28 of 1922) provides for the appointment of a Registrar of Co-operative Societies, and for the formation and registration of agricultural co-operative societies with unlimited, and agricultural co-operative companies with limited, liability. The principal objects for which these societies and companies may be formed are (i.) to arrange the sale of produce and the purchase of agricultural requisites in the most profitable manner; (ii.) to recruit and supply labourers; and (iii.) to carry on the business of banking and insurance under a co-operative system" (1922 *Year Book*, p. 549).

There are some 400 Agricultural Societies and Farmers' Associations in the Union, for the most part affiliated to one or other of the four Agricultural Unions which have been established for the Cape Province, Natal, the Orange Free State, and the Transvaal, respectively. There are also a number of important bodies by which the interests of various branches of the land industry are furthered, such as: The Nurserymen's and Seedmen's Association of South Africa; The Co-operative Wine Farmers' Association of South Africa; The South African Sugar Association; The South African Maize Breeders, Growers, and Judges' Association; and The South African Fruit Growers' Exchange.

Extensions and improvements of facilities for transport have been carried out on a large scale during the last few years. For the period extending from 1910, when the union was established, to 1921, the railways have been extended by 2,550 miles at a cost of £9,677,737. The road mileage in 1915-16 was 47,372, the number of bridges 536, and the expenditure £389,827; the corresponding figures for 1920-21 were 60,374,611, and £1,266,228. With the object of discovering a new outlet for the Transvaal coal trade "The Union Government instituted in 1922 an investigation into the possibilities of developing a new outlet on its eastern seaboard through northern Zululand, a very rich but little-known area of South Africa. . . . An inspection of prospective connecting routes . . . revealed the fact that very economical railways with easy gradients could be constructed to serve a new harbour on the Zululand coast with the added advantage that more than a million acres of Crown lands, rich in general agricultural prospects and highly suited to the production of cotton and sugar cane, would be opened up to settlement" (1922 *Year Book*, p. 758).

The rapid transmission of information is only second in commercial importance to the speedy transport of commodities, and the Union of South Africa is forging a new link of Empire in its interests: "In September, 1922, the Union Government entered into an agreement with the Marconi's Wireless

Telegraph Company, Ltd. (England), for the erection of a high-power wireless station capable of direct communication with the United Kingdom" (1922 *Year Book*, p. 811).

The development of RHODESIA, the KENYA COLONY, and the TANGANYIKA TERRITORY is largely bound up with the question of communications and convenient outlets for export. The two latter have their own share in the coast-line, but Rhodesia is separated from the sea by Portuguese East Africa, the nearest seaport being Beira, and it is a fortunate circumstance that this is in the possession of a friendly power. The initial capital required by migrants for the three parts of the Empire in question is somewhat larger than for the Union of South Africa, and £2,500 is considered bedrock for Southern Rhodesia.

As regards the possibilities by way of the increased production of food of vegetable nature in the parts of Africa under consideration, the outstanding points have received notice in Section II. For the Union, maize and other cereals, fruit, sugar cane, and wine are of most importance; while cereals and citrus fruit have good prospects in Southern Rhodesia, and later on the former may swell the exports of the Kenya Colony. The Tanganyika Territory even now exports a small amount of grain, and this is likely to increase when economic conditions improve, though at the present time the depression of trade is acutely felt.

Industrialization is making steady progress in certain parts of the Union of South Africa, and numerous factories are concerned with working up vegetable products, as may be seen from the following figures for 1920-21:

	Number.	*Value of Materials.*	*Value of Output.*
		£	£
Bakeries, bread and biscuit factories ..	333	3,350,858	4,669,837
Breweries (including native beer breweries and malt works)	90	800,948	2,060,754
Grain mills	705	11,032,134	12,133,426
Jam factories, fruit-preserving works, and sweet factories	71	1,306,752	1,816,320

A few figures from the Statistical Summary of Progress (1922 *Year Book*, p. 1053) will also be of interest:

		1904.	1911.	1921.
Agricultural production:				
Maize	Tons	452,967	863,252	1,334,724
Kaffir corn	,,	136,793	154,773	155,405
Wheat	,,	70,865	181,032	228,401
Oats	,,	65,356	154,569	95,617
Barley	,,	24,258	30,573	28,535
Potatoes	,,	82,207	92,119	112,013
Wine	1,000 Gals.	5,687	7,501	16,945
Total imports (including specie)	£1,000	32,476	36,925	57,800
Total exports (excluding specie)	£1,000	29,744	57,024	74,354
Maize exported	Tons	8,102	103,277	388,623
Vessels entered	Number	—	1,805	1,217
	Tonnage	—	5,417,444	4,198,683
Vessels cleared	Number	—	1,803	1,204
	Tonnage	—	5,439,166	4,177,959

3. Other Parts of the Empire with Mainly Native Population.—The most important of these in respect of vegetable food production are the British West Indies and British Guiana. We are here mainly concerned with fruit and sugar cane. Considerable development of the fruit industry is possible, but the future of cane sugar, which vitally affects the future of all the cane-growing parts of the Empire, depends on a number of factors, among which fiscal policy is of the most importance. Taking a long series of years, say from 1840, it will be found that the world consumption of sugar doubles every twenty years. It was first satisfied by cane sugar, but the rise of the beet sugar industry resulted in its gradual replacement by beet sugar to an increasing extent, until this came to occupy first place. According to the Board of Trade returns the United Kingdom imported 1,948,264 tons of sugar in 1913, this consisting of: raw cane, 395,672; refined cane, 670; raw beet, 645,970; refined beet, 905,952. Owing to the disorganization of the European beet sugar industry as a result of the War, cane sugar has resumed, for the present, its former dominance, placing the British West Indies and British Guiana in a much stronger position, though Cuba is far ahead of every other country as regards the total output. Nevertheless, sugar remains dear, for there is still a shortage, and the check on the industry caused by the War will continue to make itself felt for a considerable period. The world production for 1922-23 was estimated by Willett and Gray, in July, 1923, at 18,257,441 tons, made up of 13,118,401 cane and 5,139,040 beet.

The attraction of enough capital to make the Empire self-supporting as regards sugar will entirely depend upon whether the cultivation of sugar cane is secured against foreign competition for a considerable number of years. Capital is necessary, not merely for increasing the area of cultivation, but also to enable the most up-to-date methods of increasing yield and dealing with the crop.

Little need be said here about increasing food production in such parts of the Empire as the West African Colonies and Territories, Uganda, British Malaya, the Bornean Colonies, and the Pacific Islands. Their most important vegetable products are nuts and seeds furnishing raw materials for oil extraction, though here it is true that some of the oils are used as food, and that the residues are employed for stock-feeding; cotton, sisal, and other fibres; rubber; tobacco, tea, coffee, and cacao; and spices. All these are dealt with in other volumes in this Series. There is, however, the question of tropical fruits, such as bananas and pineapples, where increased production is in many cases possible. It may also be remarked that we rely almost entirely upon foreign countries for our supply of dates. In one part of the Empire, the Sudan, the date palm is indigenous, but the fruit, for the most part, is consumed locally. The production of an exportable surplus on a considerable scale would appear to be within the bounds of possibility, though at present it is not a commercial proposition.

Even, however, in Colonies or Territories where, from the nature of the case, the production of food for export is impossible, or would interfere with the more important business of securing an increased output of some kind of raw material, it would be desirable to reduce the dependence on imported food by increasing production for local consumption. The point has already been

raised in regard to the Tanganyika Territory (p. 79), and many other instances might be adduced. Ceylon, for instance, imports a considerable amount of rice from India, and suffers should there be a failure in the crop there. In fact, every part of the Empire has its own food problems, and in all cases the import of one kind of food or other may be necessary; but, other things being equal, the sound policy is to draw upon Imperial food resources in preference to relying on the products of foreign countries. In order to prevent repetition it will be convenient to postpone further consideration of other general questions to the end of the next volume, after a review has been presented of Empire resources with regard to food of animal origin. For it is obviously desirable to deal with food as a whole, whatever may be the industry by which it is rendered available—agriculture, horticulture, the pastoral side of production, or fisheries.

1931

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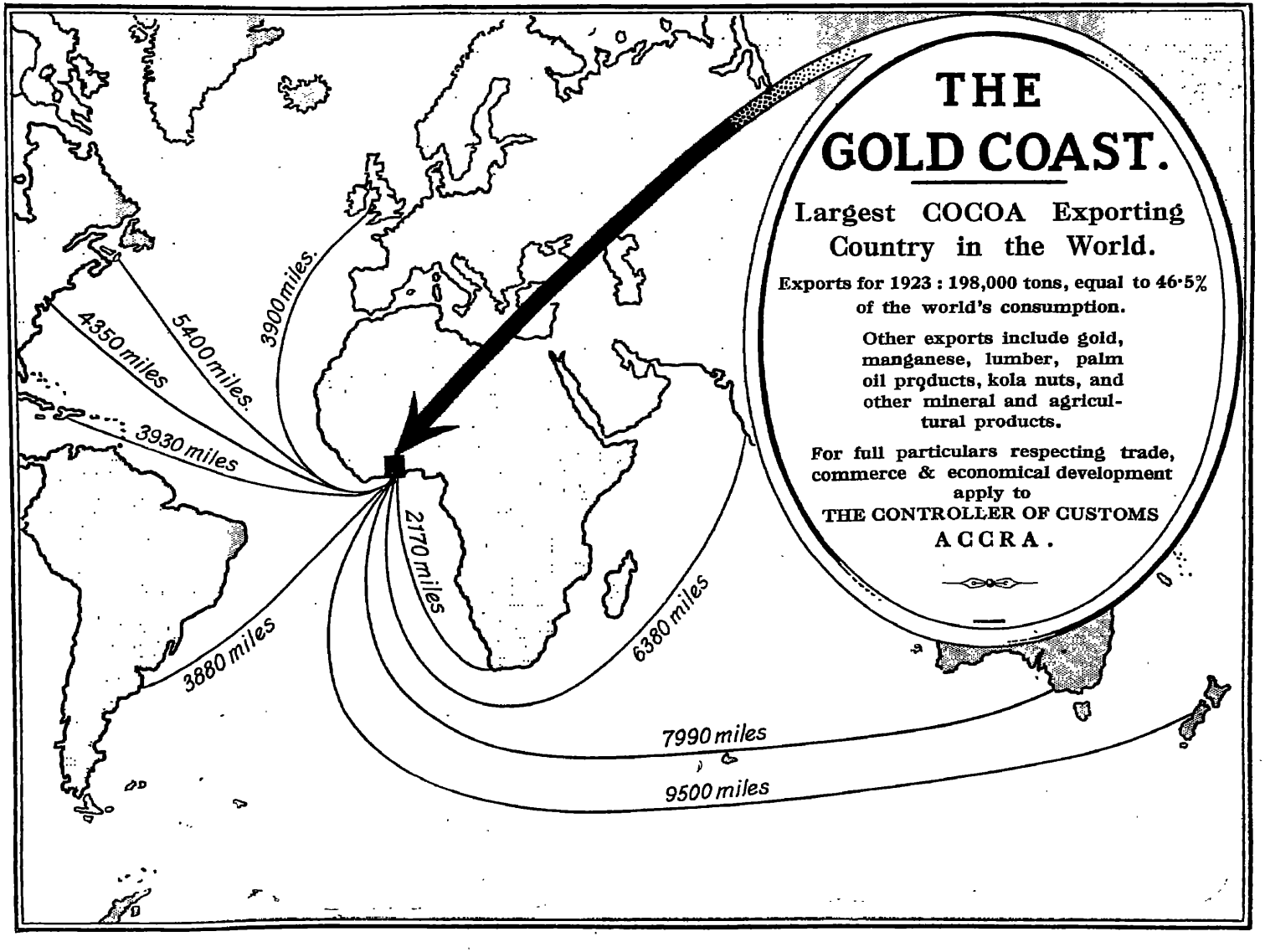
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